

WESTWARD REGION SHELLFISH REPORT TO THE
ALASKA BOARD OF FISHERIES

BY

WESTWARD REGION SHELLFISH STAFF

COMPILED BY WILLIAM E. NIPPES

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ALASKA DEPARTMENT OF FISH AND GAME
COMMERCIAL FISHERIES DIVISION
WESTWARD REGION (REGION IV)
SHELLFISH STAFF (FULLTIME)

Larry D. Nicholson.....Regional Supervisor, Kodiak

Dana Schmidt.....Regional Research Biologist,
Kodiak

William E. Nippes.....Westward Region Shellfish/
Groundfish Management
Coordinator, Kodiak

James A. Spalinger.....Kodiak Area Shellfish
Management Biologist, Kodiak

Dan O. Dunaway.....Chignik/South Peninsula Area
Shellfish Management
Biologist, Sand Point

Kenneth L. Griffin.....Bering Sea/Aleutian Islands
Area Shellfish Management
Biologist, Dutch Harbor

Dave R. Jackson.....Shellfish Trawl Assessment
Project Leader

William Donaldson.....Research Biologist, Kodiak

Forrest Blau.....Research Biologist, Kodiak

Jim Blackburn.....Research Biologist, Kodiak

Georgia Putney.....Regional Shellfish
Management Secretary, Kodiak

Lucinda Neel.....Publications Technician,
Kodiak

Joanne Shaker.....Data Processing Clerk II,
Kodiak

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WESTWARD REGION REPORT TO THE BOARD OF FISHERIES

MARCH 1990

INTRODUCTION

The Regional Office is located in Kodiak with field offices in Sand Point and Dutch Harbor. This report documents shellfish activities in the Region which are in progress 12 months of the year. Alaska Department of Fish and Game Biologists are charged with the State management and research programs associated with all commercially utilized stocks of shellfish. The staff (full time) consists of four Management Biologists, three Research Biologists, and one Secretary. Approximately twelve seasonal personnel are hired for shellfish assessment cruises, logbook programs, shipboard observations, interviews, dockside sampling, and secretarial assistance.

The Westward Region's (Region IV) boundaries extend south from the latitude of Cape Douglas on the Alaskan Peninsula, encompassing Kodiak Island; then 1,200 miles to Attu Island in the Aleutians, then northeast to Norton Sound, including the Bering Sea (Figure 1). The area encompasses 525,000 square miles of the most productive shellfish habitat in the world. The three major shellfish commercial fisheries are king crab (3 species), Tanner crab (2 species), and Dungeness crab, with minor fisheries occurring for scallops, shrimp, clams, octopus and sea urchins. In 1989 approximately 500 catcher vessels, 23 catcher/processors, 21 shore based processors, and 16 floating processors (Table 1) were actively engaged in harvesting and/or processing shellfish resources. The 1989 king crab catch was 22.7 million pounds valued at over 91.0 million dollars; the 1989 Tanner crab catch was 163.4 million pounds valued at \$2.94 per pound for *C. bairdi* and \$0.75 per pound for *C. opilio* totaling 153.3 million dollars; the 1989 Dungeness catch was 3.1 million pounds valued at \$3.4 million. The

value of the three major shellfish fisheries was 247.7 million dollars. This approaches the record value obtained in 1980 (Table 2).

SHRIMP

There was no regional trawl shrimp harvest in 1989 (Table 3). Poor production in recent years discouraged fishermen and processors from harvesting in 1989. Their decision was due in part to more favorable conditions on the Washington and Oregon coast. A small harvest of pot shrimp occurred, but the low effort level was confidential.

A 50-day shrimp survey in 1989 of historically important grounds showed little or no stock improvement. The Westward staff anticipates the next survey of shrimp stocks in 1991.

KING CRAB

The Westward Region 1989 king crab harvest was approximately 22.7 million pounds with the Adak brown king season in progress until August (Table 4). The red king crab seasons were closed once again in Kodiak (K), South Peninsula (M) and Dutch Harbor (O). These areas have been closed continuously since 1983. The department has surveyed these areas to assess the populations which continue to show little or no recruitment as well as associated reproductive problems.

This year, like last, the only red king crab population showing stability but at a low level was Bristol Bay. A total of 10.3 million pounds were harvested from Bristol Bay which is up from the previous season's 7.4 million pound harvest (Table 4). The Bristol Bay stock is expected to change little in 1990 while stocks in the Kodiak, South Peninsula, Dutch Harbor, Pribilof, and St. Matthew Island areas are expected to at best maintain their current levels. Based on past fishery performance and survey information, the

1990/91 harvest is projected to fall between 15 to 20 million pounds. This projection is subject to revision after the 1990 summer surveys are completed.

TANNER CRAB

The 1989 Tanner crab season produced 163.4 million pounds which is the peak production for Tanner crab in the region (Table 5). The catch in 1989 was comprised of approximately 91% *C. opilio* crab.

Stocks of *C. opilio* crab look very healthy with harvest expectations in excess of 100 million pounds for the next few years. *C. bairdi* stocks while small in a historic sense, are healthy and the harvestable stock is expected to remain stable in most areas, with some increase in the Bering Sea.

DUNGENESS CRAB

The 1989 Dungeness crab harvest in the Westward Region was 3.1 million pounds (Table 6). This was an increase in catch over the previous season at near the historic average catch. The Kodiak District produced the majority of the harvest in 1989 and is expected to do so again during the 1990 season.

MANDATORY OBSERVERS

On September 25, 1988 the mandatory observer requirement went into effect for vessels processing king and *C. bairdi* crab. The regulation adopted at the Board of Fisheries spring 1988 meeting required the industry to fund these observers. They are provided by a third party contractor and certified by the Department of Fish and Game.

The program has been active for over a year with observers participating in nine fisheries. Preliminary data indicates that the observers' presence onboard the catcher/processors has served as a deterrent for taking undersized crab.

Details of this program are discussed later in this report.

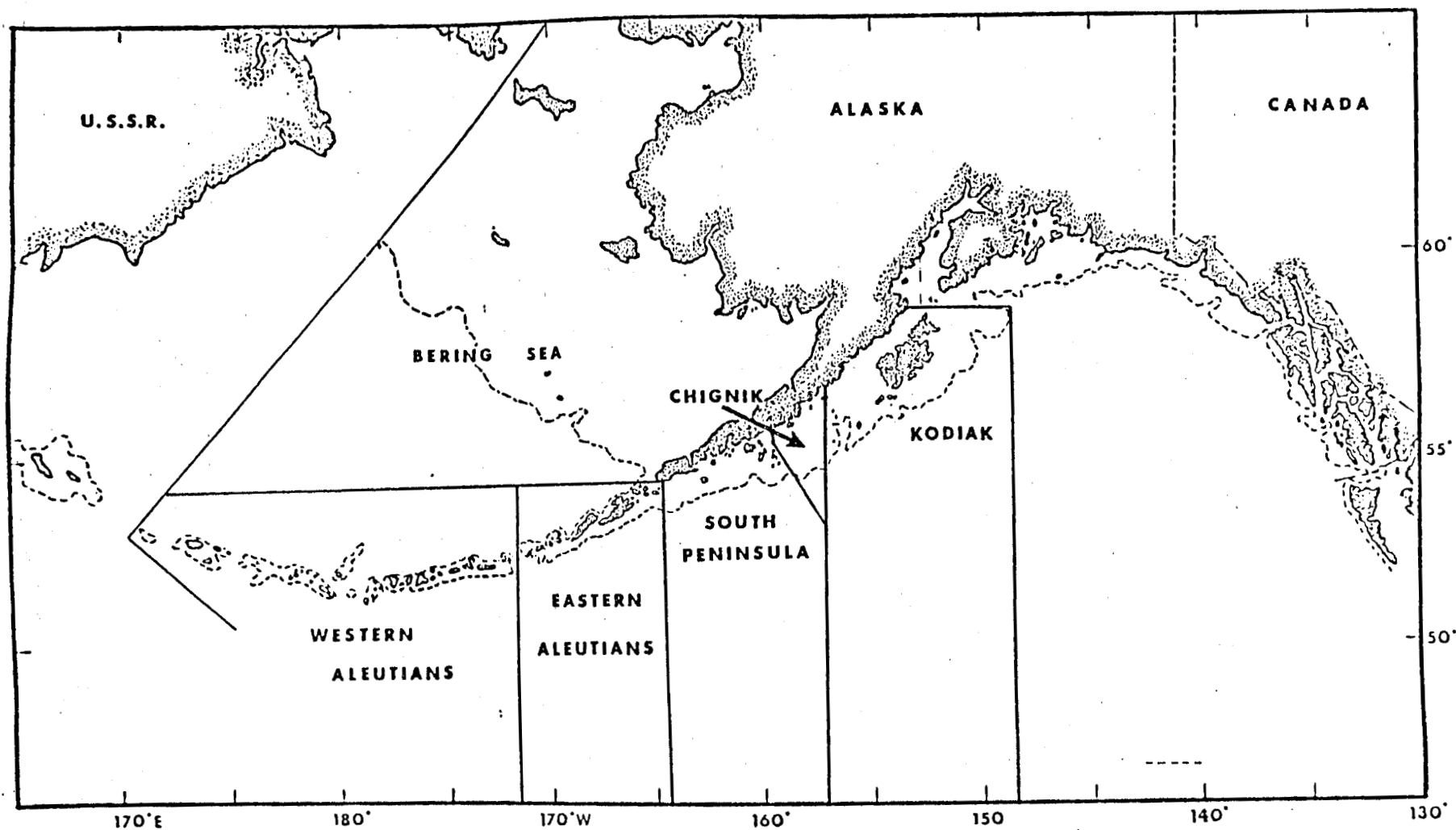


FIGURE 1. TANNER CRAB DISTRICTS— WESTWARD REGION

Table 1. Shellfish processors operating in the Westward Region during the 1989/90 fishing seasons.

Location	Company	*Products	Superintendent
Kodiak	Alaska Fresh Seafoods	KTMD	Dave Woodruff
	All Alaskan	KTMD	Tim Blott
	Alaska Pacific Seafoods	TMD	John Severe
	Cook Inlet Processing	TMD	Wayne Selby
	East Point Seafoods	KTMDS	Jim Major
	Emerald Island Seafoods	MTD	Chris Schopen
	Kodiak King Crab	KTMD	Stewart Litton
	North Star Seafoods	M	Sylvia Guild
	Skookum Chuck	TD	Ray Fuford
	Ursin Seafoods	KTMD	Craig Priebe
	Western Alaska Fisheries	KTMD	Ken Allread
	Trident Seafoods	TD	Paul Pagette
	Peter Pan Seafoods	KT	
Sand Point	Deep Sea	KTM	
King Cove	Trident	KTM	Clyde Lovett
Akutan	Alyeska Seafoods	KTM	Frank Kelty
	Aleutian Processors	KTMD	Pat Ziegler
Dutch Harbor	Arctic Star	KTM	Jay Hendrickson
	East Point Seafoods	KTD	Chuck Corbit
	Sans Souci	KTDM	Nikata
	Unisea Seafoods	KTDM	Steve Stubbe

FLOATER/PROCESSORS

Alaskan I	T
All Alaskan	K
Alaska Packer	K
Aleutian Falcon	T
Aleutian Queen	KTM
Akutan	KT
Blue Wave	T
Clipperton	KTM
Coastal Star	KT
Galaxy	KT
Mr. B	KT
Northern Alaskan	KT
Northland	KT
Omni Sea	KT
Tempest	KTM
Yard Arm Knot	T

CATCHER/PROCESSORS

Alaskan Enterprise	KT
Arctic Discovery	K
Arctic Orion	KT
Baranof	KT

Table 1. Shellfish processors operating in the Westward Region during the 1989/90 fishing seasons (continued).

Location	Company	*Products	Superintendent
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CATCHER/PROCESSORS (cont.)

Bountiful	KT
Courageous	KTM
Diomedes	KT
Deep Sea Harvester	K
Jacquelyn R	K
Northern Enterprise	K
Optimus Prime	K
Pacific Wind	KT
Patricia Lee	KTM
Pavlof	KTM
Pengwin	KTM
Perserverence	KT
Pro Surveyor	K
Rondys	KT
Seawind	K
Shishaldin	KTM
Skipbladnir	KTM
Western Enterprise	KT
Westward Wind	KTM
Windance	KT

* K = King Crab T = Tanner Crab S = Shrimp
D = Dungeness M = Scallops, Clams, Haircrab, Octopus, Urchins

Table 2. Westward Region king crab, shrimp, Tanner crab and Dungeness crab pounds, price per pound and value to the fishermen 1950 to 1989.

Year	-----SHRIMP-----			-----KING CRAB-----			---TANNER CRAB ¹ ---			-DUNGENESS CRAB-			----TOTAL----	
	# ²	Price ³	Value ⁴	# ²	Price	Value ⁴	# ²	Price	Value ⁴	# ²	Price	Value ⁴	# ²	Value ⁴
1950				2.1										
1951				.8										
1952				.7										
1953				3.3										
1954				6.6										
1955				5.5										
1956				10.9										
1957				12.3										
1958				12.4										
1959				16.4										
1960	3.4	.039	.13	30.4	.085	2.58							33.9	2.71
1961	11.0	.04	.44	38.6	.095	3.66							49.6	4.10
1962	12.6	.04	.50	49.5	.10	4.95				1.9	.09	.17	64.0	5.62
1963	10.1	.043	.43	66.8	.10	6.68				2.4	.09	.21	79.3	7.32
1964	3.9	.04	.15	91.8	.10	9.18				4.2	.09	.38	99.9	9.71
1965	13.8	.04	.55	138.2	.128	17.68				3.3	.12	.40	155.3	18.63
1966	24.1	.045	1.08	136.2	.11	14.90				1.2	.13	.16	161.5	16.14
1967	39.6	.045	1.78	103.4	.26	26.88	.1	.07	.007	6.6	.13	.86	149.7	29.53
1968	39.7	.04	1.58	69.0	.26	17.94	2.7	.10	.27	8.0	.14	1.12	119.4	20.91
1969	45.0	.055	2.48	54.7	.28	15.32	8.5	.11	.64	3.8	.16	1.08	115.0	19.82
1970	68.2	.04	2.73	49.9	.30	14.97	11.3	.11	1.24	5.7	.14	.80	135.1	19.74
1971	88.6	.04	3.54	52.8	.39	20.59	9.8	.11	1.07	1.4	.18	.25	152.6	25.45
1972	78.0	.04	3.12	70.4	.55	38.72	15.6	.13	2.03	2.1	.40	.84	166.1	44.71
1973	117.8	.08	9.42	69.3	.45	31.18	38.0	.17	6.46	2.2	.50	1.10	247.1	48.16
1974	104.0	.08	8.32	94.3	.45	42.43	43.4	.20	8.68	.8	.47	.38	242.5	59.81
1975	92.1	.08	7.37	96.7	.66	63.82	33.2	.17	5.64	.6	.61	.37	222.6	77.20
1976	119.3	.10	11.93	101.4	1.37	138.91	64.8	.20	12.96	.08	.15	.01	285.6	168.81
1977	110.6	.13	14.38	94.6	1.34	126.76	86.4	.33	28.51	.1	.30	.03	291.7	169.68
1978	64.2	.165	10.59	119.9	1.60	191.80	114.3	.43	49.15	1.3	.75	.98	301.4	253.16
							1.7	.38	.64					

continued....

Table 2. Westward Region king crab, shrimp, Tanner crab and Dungeness crab pounds, price per pound and value to the fishermen 1950 to 1989 (continued).

Year	-----SHRIMP-----			-----KING CRAB-----			---TANNER CRAB ¹ ---			-DUNGENESS CRAB-			-----TOTAL-----	
	# ²	Price ³	Value ⁴	# ²	Price	Value ⁴	# ²	Price	Value ⁴	# ²	Price	Value ⁴	# ²	Value ⁴
1979	44.6	.225	10.03	151.6	.95	144.02	84.2	.55	46.30	1.4	.75	1.05	314.0	211.06
							32.2	.30	9.66					
1980	43.1	.29	12.49	189.6	1.05	199.08	4.0	.55	35.20	2.0	.45	.90	338.20	255.97
							39.5	.21	8.30					
1981	21.5	.27	5.81	85.3	2.0	170.60	49.3	.65	32.05	5.6	.70	3.92	214.40	226.08
							52.7	.26	13.70					
1982	11.2	.27	3.02	38.5	3.75	144.48	34.2	1.65	56.43	5.3	.75	3.98	118.5	229.19
							29.3	.73	21.38					
1983	2.8	.35	.98	25.0	3.00	75.00	31.4	1.25	39.25	5.90	1.05	6.20	91.3	130.60
							26.2	.35	9.17					
1984	2.9	.33	.95	17.1	2.75	47.02	18.8	1.10	20.68	6.0	1.40	8.40	70.8	86.22
							26.0	.30	7.80					
1985	1.2	.20	.24	20.4	2.50	51.00	18.4	1.50	27.60	4.6	1.20	5.52	109.1	103.71
							64.5	.30	19.35					
1986	.5	.25	.13	17.3	3.50	60.50	13.2	1.90	25.08	1.2	1.15	1.38	128.7	144.99
							96.5	.60	57.90					
1987	0.0	0.00	0.00	27.3	3.50	95.46	7.6	2.11	16.02	1.7	1.25	2.07	138.5	189.98
							101.9	.75	76.43					
1988	Confidential			20.0	3.98	79.37	9.9	2.36	23.40	2.3	1.06	2.44	167.6	209.86
							135.4	.77	104.25					
1989	0.0	0.00	0.00	22.7	4.02	91.07	14.0	2.94	41.17	3.1	1.10	3.40	189.3	247.74
							149.5	.75	112.10					

- ¹ *C. bairdi* and *C. opilio*
² Millions of pounds
³ Dollars
⁴ Millions of dollars

Table 3. Historic domestic trawl shrimp catch, Alaska Westward Region, 1960-89.

Calendar Year	Kodiak	Chignik	South Peninsula	Aleutians	Total
1960	3,379,000				3,379,000
1961	11,083,500				11,083,500
1962	12,654,300				12,654,300
1963	10,118,500				10,118,500
1964	3,946,900				3,946,900
1965	13,810,500				13,810,500
1966	24,097,100				24,097,100
1967	38,722,100		879,900		39,602,000
1968	34,468,700	1,153,700	4,137,400		39,759,800
1969	41,243,600	419,900	3,365,600		45,029,100
1970	62,369,300	1,226,800	4,634,700		68,230,800
1971	82,153,724	987,900	5,532,400		88,674,024
1972	58,352,319	4,829,800	14,740,800	94,627	78,017,546
1973	70,511,477	26,884,200	20,022,000	456,179	117,873,858
1974	48,771,375	23,392,400	26,145,900	5,749,407	104,059,082
1975	46,806,799	24,435,400	20,044,400	893,567	92,180,166
1976	51,400,472	27,059,700	37,170,300	3,670,609	119,301,081
1977	31,801,573	27,797,739	46,454,376	4,599,858	110,653,546
1978	22,820,135	22,976,720	11,812,795	6,618,263	64,227,913
1979	14,540,901	23,722,330	3,134,367	3,236,721	44,634,319
1980	27,783,437	12,843,270	C L O S E D	2,479,350	43,106,057
1981	19,030,341	70,948	C L O S E D	2,398,458	21,499,747
1982	10,884,059	0 ¹	0 ¹	341,551	11,225,610
1983	2,779,030	0 ¹	0 ¹	5,600	2,784,630
1984	3,023,438	0 ¹	0 ¹	0 ¹	3,023,438
1985	1,159,912	0 ¹	0 ¹	0 ¹	1,159,912
1986	453,468	0 ¹	0 ¹	0 ¹	453,468
1987	0 ¹	0 ¹	0 ¹	0 ¹	0 ¹
1988			Confidential		
1989	0 ¹	0 ¹	0 ¹	0 ¹	0 ¹
AVERAGE (Years Fished)	26,720,606	14,128,629	15,236,533	2,377,888	41,963,058

Source: Westward Region Shellfish Management Office (3/88).

¹Season Open - No Catch Reported

Table 4. Historic king crab catch by registration area for Alaska's Westward Region (in thousands of pounds), 1950 to 1989.

Year	K Kodiak	M Chignik South Pen.	O Unalaska	R Adak W.Aleutian	Q Bering Sea	T Bristol Bay	U.S.	Foreign	Total
1950	60.0	2,124.0	NF	NF	NF	NF	2,184.0	0	2,184.0
1951	200.0	599.0	NF	NF	NF	NF	799.0	0	799.0
1952	400.0	298.0	NF	NF	NF	NF	698.0	0	698.0
1953	900.0	380.0	NF	NF	NF	2,000.0	3,280.0	11,356.0	14,636.0
1954	4,000.0	317.0	NF	NF	NF	2,329.0	6,646.0	8,086.0	14,732.0
1955	2,000.0	1,641.0	NF	NF	NF	1,878.0	5,519.0	8,693.0	14,212.0
1956	4,800.0	4,221.0	NF	NF	NF	1,896.0	10,917.0	8,308.0	19,225.0
1957	5,000.0	6,687.0	NF	NF	NF	588.0	12,275.0	8,548.0	20,823.0
1958	5,200.0	7,246.0	NF	NF	NF	7.0	12,453.0	8,136.0	20,589.0
1959	10,200.0	6,167.0	NF	NF	NF	NF	16,367.0	11,602.0	27,969.0
Subtotal	32,760.0	29,680.0	-	-	-	8,698.0	71,138.0	64,729.0	135,867.0
Average	3,276.0	2,968.0	-	-	-	1,449.6	7,113.0	9,247.0	13,586.7
1960-61	21,064.0	6,700.0	NF	2,093.7	NF	598.0	30,456.5	24,611.0	55,067.5
1961-62	28,962.9	3,900.0	533.0	4,776.0	NF	459.0	38,630.9	40,404.0	79,034.0
1962-63	37,626.7	2,273.0	1,536.0	8,006.5	NF	74.0	49,543.2	49,516.2	102,782.2
1963-64	37,716.2	6,539.0	3,893.0	17,903.7	NF	747.0	66,798.9	56,671.0	123,469.9
1964-65	41,596.5	14,354.0	13,761.0	21,193.0	NF	910.0	91,815.0	63,076.0	154,891.3
1965-66	94,431.0	14,713.0	19,196.0	8,040.0	NF	1,762.0	138,142.4	41,405.0	179,547.4
1966-67	73,817.8	22,577.0	32,852.0	5,883.1	NF	997.0	136,126.9	43,998.0	180,124.9
1967-68	43,448.5	17,252.0	22,709.0	16,948.9	NF	3,102.0	103,460.4	32,528.0	135,988.4
1968-69	18,211.4	10,944.0	11,300.0	19,874.8	NF	8,687.0	69,017.2	27,681.0	96,698.2
1969-70	12,200.5	4,137.0	8,950.0	19,055.4	NF	10,403.0	54,745.9	14,113.0	68,858.9
Subtotal	409,076.3	103,389.0	114,730.0	123,778.3	-	27,739.0	778,737.6	394,003.2	1,176,463.6
Average	40,907.6	10,338.9	12,747.8	12,377.6	-	2,773.9	77,873.8	39,400.3	117,646.4

Table 4. (continued) Historic king crab catch by registration area for Alaska's Westward Region (in thousands of pounds), 1950 to 1989.

Year	K Kodiak	M Chignik South Pen.	O Dutch Harbor	R Adak W. Aleutian	Q Bering Sea	T Bristol Bay	U.S.	Foreign	Total
1970-71	11,719.9	3,425.7	9,652.0	16,057.0	NF	8,559.2	49,913.6	12,930.0	62,843.6
1971-72	10,884.1	4,123.1	9,391.6	15,475.9	NF	12,995.8	52,869.7	6,188.0	59,057.7
1972-73	15,479.9	4,069.3	10,450.4	18,724.1	NF	21,744.9	70,490.7	4,721.0	75,211.7
1973-74	14,397.3	4,260.6	12,722.7	9,741.5	1,276.6	26,913.6	69,331.8	1,279.0	70,610.8
1974-75	23,582.7	4,572.1	13,991.1	2,775.0	7,107.3	42,266.3	94,274.0	2,618.0	96,892.0
1975-76	24,061.6	2,605.3	15,906.6	437.1	2,433.7	51,326.2	96,747.4	NF	96,747.4
1976-77	17,966.8	958.8	10,198.4	2.3	8,356.1	63,919.7	101,399.8	NF	101,399.8
1977-78	13,503.6	726.3	3,684.4	953.0	8,201.8 ¹	69,967.8	94,567.9	NF	94,567.9
1978-79	12,021.8	3,093.8	6,824.1	807.2	10,387.7 ¹	87,618.3	119,933.7	NF	119,933.7
1979-80	14,608.9	4,453.5	15,010.9	490.7	9,230.3 ¹	107,828.0	151,647.4	NF	151,647.4
Subtotal	158,226.6	32,288.5	107,832.2	65,463.8	46,993.5	493,138.8	901,176.0	27,736.0	928,912.0
Average	15,822.6	3,228.9	10,783.2	6546.4	6,713.4	49,313.9	90,117.6	5,547.2	92,891.2
1980-81	20,448.6	5,080.6	19,053.6	1,478.4	11,543.8	129,948.5	89,668.8	NF	189,423.3
1981-82	24,237.6	3,147.5	5,231.1	2,843.0	13,772.5	33,591.4	85,291.4	NF	85,291.4
1982-83	8,729.2	1,627.7	1,616.2	9,708.1	13,447.3	3,001.2	38,497.8	NF	38,497.8
1983-84	111.4 ²	CLOSED	1,810.0	10,109.6	11,701.9	CLOSED	25,463.1	NF	25,463.1
1984-85	22.2 ²	CLOSED	1,521.1	5,508.7	4,701.3	4,182.4	17,115.2	NF	17,115.2
1985-86	63.6 ²	CLOSED	1,968.2	11,931.0	2,959.8	4,174.9	20,405.4	NF	20,405.4
1986-87	146.5 ²	CLOSED	1,869.2	13,510.2	1,262.1	11,393.9	17,308.5	NF	17,308.5
1987-88	67.2 ²	CLOSED	1,383.2	3,190.0 ⁴	2,200.9	12,289.1	19,130.4	NF	19,130.4
1988-89	2.8 ²	CLOSED	1,545.1	9,571.1 ³	1,488.3	7,387.8	19,955.1	NF	19,955.1
1989-90	*	CLOSED	1,712.9	9,251.9 ³	1,428.2	10,264.8	22,657.8	NF	22,657.8
Subtotal	53,829.6	9,855.8	37,711.6	77,102.0	64,506.1	216,234.0	455,493.5	NF	455,493.5
Average	5,981.1	3,285.3	3,771.2	7,710.2	6,450.6	21,623.4	45,549.4		45,549.4

¹ Fishing Year - July 1 through June 30

² Brown crab

³ Calendar Year

⁴ Through January 31

* Confidential catch

NF = No fishing

Table 5. Historic Tanner crab C.bairdi and C.opilio catch (in pounds) for Alaska, Westward Region, 1965-1989.

Year ¹	Kodiak	Chignik ²	South Peninsula	Eastern Aleutians	Western Aleutians	Bering Sea		Total U.S. Harvest	Total Foreign Harvest
						C. opilio	C. bairdi		
1965	0	0	0	0	0	0	0	0	3,936,000
1966	0	0	0	0	0	0	0	0	7,290,000
1967	110,961	0	5,000	0	0	0	0	115,961	24,000,000
1968	2,560,687	0	131,700	0	0	0	17,900	2,710,287	30,940,000
1969	6,796,477	0	644,400	0	0	0	1,008,900	8,449,777	47,668,000
1970	7,749,859	0	2,022,427	0	0	0	1,014,700	11,259,447	47,828,000
1971	7,436,414	152,256	2,140,755	0	0	0	166,100	9,875,888	39,886,000
1972	11,898,054	23,343	3,618,883	0	0	0	107,761	15,662,354	31,186,000
1973	31,113,459	747,788	5,615,563	62,128	168,354	0	231,668	38,008,640	27,886,000
1974	25,479,717	4,202,671	9,503,366	498,836	71,887	0	5,044,197	43,409,968	27,912,000
1975	17,535,844	3,649,444	5,195,800	77,164	3,350	0	7,284,378	33,225,873	18,456,000
1976	23,446,245	6,926,161	11,201,941	534,295	62,180	0	22,341,475	64,818,920	19,286,000
1977	20,720,079	5,672,919	6,773,838	1,301,654	0	0	51,455,221	86,405,326	21,520,173
1978	33,271,472	4,693,830	7,446,270	2,624,016	237,512	1,716,124	66,648,954	116,014,238	33,057,796
1979	29,173,807	2,536,105	8,684,408	1,092,311	197,244	31,102,832	42,547,174	116,411,771	32,914,536
1980	18,623,875	3,517,920	3,961,251	879,807	337,297	39,344,323	36,614,315	103,507,133	15,636,125
1981	11,748,629	3,653,723	3,294,106	654,514	220,716	50,483,055	29,732,086	102,056,808	NF
1982	13,756,159	3,240,526	4,589,042	739,694	838,627	29,351,474	11,008,779	63,542,301	NF
1983	18,927,061	3,497,370	2,863,798	547,830	448,399	26,128,410	5,273,881	57,686,749	NF
1984	14,789,903	659,043	1,789,883	239,395	191,954	26,813,074	1,208,223	45,691,225	NF
1985	12,024,553	385,838	2,561,868	165,529	66,549	65,998,875	3,151,498	82,900,497	NF
1986	8,974,520	184,907	3,763,761	166,939	72,441	97,984,539	NF	109,674,455	NF
1987	4,833,473	195,060	2,400,784	160,292	42,761	101,903,388	NF	109,535,758	NF
1988	3,888,906	183,111	3,328,809	309,918	169,289	134,060,185	2,210,394	144,150,612	NF
1989	5,208,999	323,120	1,055,082	328,696	53,181	149,455,340	7,012,965	163,437,891	NF
TOTAL	330,069,130	44,445,135	92,587,735	10,363,349	3,181,741	754,992,989	294,080,569	1,529,846,331	429,402,630
AVERAGE	14,350,833	2,339,218	4,025,553	610,785	198,859	62,916,082	14,704,028	66,515,058	26,837,664

SOURCE: Westward Regional Shellfish Management Office (3/1/88)

¹ Calendar Year² Chignik and South Peninsula catches combined 1967 through 1970

NF = No fishing

Table 6. Historic Dungeness crab catch (in pounds), Alaska Westward Region, by District 1962-89.

Calendar Year	Kodiak	Alaska Peninsula	Aleutian	Total
1962	1,904,567	NF	NF	1,904,567
1963	2,487,512	NF	NF	2,487,512
1964	4,162,182	NF	NF	4,162,182
1965	3,311,571	NF	NF	3,311,571
1966	1,148,600	NF	NF	1,148,600
1967	6,663,668	NF	NF	6,663,668
1968	6,829,061	1,259,000	NF	8,088,061
1969	5,834,628	1,056,000	NF	6,890,628
1970	5,741,438	13,000	NF	5,754,438
1971	1,445,864	11,000	NF	1,456,864
1972	2,059,536	65,000	NF	2,124,536
1973	2,000,526	194,500	NF	2,195,026
1974	750,057	NF	60,517	810,574
1975	639,813	NF	4,408	644,221
1976	87,110	NF	NF	87,110
1977	113,026	NF	NF	113,026
1978	1,362,306	NF	NF	1,380,340
1979	1,313,650	102,320	1,101	1,417,071
1980	2,011,736	NF	NF	2,100,736
1981	5,566,463	42,296	NF	5,608,759
1982	4,546,311	779,600	36,034	5,361,945
1983	4,752,148	1,200,978	8,975	5,962,101
1984	5,304,921	647,497	91,736	6,044,154
1985	4,153,877	462,258	16,750	4,632,885
1986	965,095	179,367	10,897	1,155,359
1987	1,450,983	182,706	26,627	1,660,316
1988	2,125,032	179,022	22,634	2,326,688
1989	3,077,937	^{1/}	11,124	3,089,061 ^{2/}
<hr/>				
TOTAL	81,809,618	6,374,544 ^{2/}	290,803	90,819,687 ^{2/}
<hr/>				
AVERAGE (Years Fished)	2,912,772	424,969 ^{2/}	26,436	3,249,284 ^{2/}

NF = No fishing

^{1/}Catch Confidential

^{2/}Except Alaska Peninsula Confidential Catch.

KODIAK AREA
SHELLFISH MANAGEMENT REPORT
TO
ALASKA BOARD OF FISHERIES

MARCH 1990

BY
JAMES A. SPALINGER - AREA MANAGEMENT BIOLOGIST
DAVID R. JACKSON - FISHERY BIOLOGIST

Kodiak Area Office
211 Mission Road
Kodiak, Alaska 99615
(907) 486-4791

INTRODUCTION

The Kodiak Shellfish Management Area is located in Southcentral Alaska, south of the latitude of Cape Douglas (58°52' N. lat.) on the Alaska Peninsula, east of the longitude of Cape Kumlik (157°27' W. long.) and west of 148°50' W. longitude. The Management Unit varies slightly for shrimp, where it extends from the latitude of Cape Douglas to the longitude of Kilokak Rocks on the Alaska Peninsula (156°19'25"W. long.). This report reviews the 1989 seasonal shellfisheries within the area and provides a synopsis of all landings from within the Kodiak area.

Tanner crab, Dungeness crab, king crab and scallops, as well as three species of shrimp, are the principal commercial species fished. A small harvest of octopus and sea urchins also occurred. Catches are reported by fishermen from individual statistical areas (Figure 1) and summarized by districts or sections (Figures 2, 3 and 4). At the Port of Kodiak, 15 million pounds of shellfish were landed during 1989, up from the 8.7 million pounds the previous year. The 1989 ex-vessel value of shellfish to the Port of Kodiak equaled 31.5 million dollars (Table 1). The single most valuable shellfish species delivered was *C. bairdi*, Tanner crab worth 17.9 million dollars.

A discussion of each shellfishery appears in individual sections of this report. Vessels fishing for shellfish in the Kodiak area during 1989 ranged in size from less than 20 feet to over 120 feet in keel length (Table 2). During 1989 a total of seven emergency orders were issued for king crab, Tanner crab and spat collection in the Kodiak Management Area. An explanation of each one is presented in Table 3. Table 4 lists the amount of vessels and pots utilized each year for king, Tanner and Dungeness crab fishing.

Table 1. 1989 landings and values of fisheries to the Port of Kodiak.

Species	Pounds ²	Ex-Vessel Value ³
Tanner		
<i>C. bairdi</i>	5,882,597	17,941,920
<i>C. opilio</i>	4,956,290	4,708,475
Dungeness	3,077,937	3,385,730
Red King Crab	885,002	4,380,760
Scallops	242,557	1,030,867
Sea Urchins	44,862	40,376
Miscellaneous ¹	1,257	4,380
Groundfish	134,297,487	18,773,613
Halibut	17,000,000	22,950,000
Salmon	36,991,100	22,919,200
Herring		
Sac Roe	4,498,000	1,911,650
Food/Bait	<u>382,515</u>	<u>153,006</u>
	208,259,604	98,199,977

¹ Includes brown king crab, blue muscles, octopus and Korean hair crab.

² Represents pounds of product landed at the Port of Kodiak and may not have been harvested in the Kodiak Management Area.

³ Value to fishermen in season and does not reflect postseason settlements.

Table 2. Keel length frequencies of Kodiak District shellfish vessels which made landings during the 1989 Tanner and Dungeness crab fishing seasons.

Vessel Keel Length	1988/89 Tanner Crab	1989 Dungeness Crab
<20	-	1
20-29.	9	9
30-39.	53	17
40-49.	64	9
50-59.	10	2
60-69.	13	7
70-79.	7	2
80-89.	11	-
90-99.	3	-
100-109.	1	-
110-119.	-	-
120-129.	1	-
130-139.	-	-
140-149.	-	-
≥150	-	-
VESSELS	171	47

Table 3. Shellfish emergency orders issued during 1989 for the Kodiak Management District.

Emergency Order	Effective Date	Explanation
Tanner Crab		
4-S-02-89	January 27, 1989	Closed the Northeast and Southeast Sections at 12:00 noon on January 27, 1989. Also closed the Eastside Section at 12:00 noon on January 29, 1989.
4-S-03-89	January 31, 1989	Closed the Southwest Section at 12:00 noon on January 31, 1989.
4-S-04-89	January 30, 1989	Closed Southwest Section 12:00 midnight January 30, 1989 due to weather and gear removal concerns. Projected a 48 hour re-opening at a later date.
4-S-05-89	February 2, 1989	Opens the Southwest Section for a 48 hour period from February 2 through February 4, 1989.
4-S-06-89	February 12, 1989	Closed the Westside Section at 12:00 noon on February 12, 1989.
4-S-07-89	February 26, 1989	Closed the North Mainland Section at 12:00 noon on February 26, 1989.

continued....

Table 3. Shellfish emergency orders issued during 1989 for the Kodiak Management District (continued).

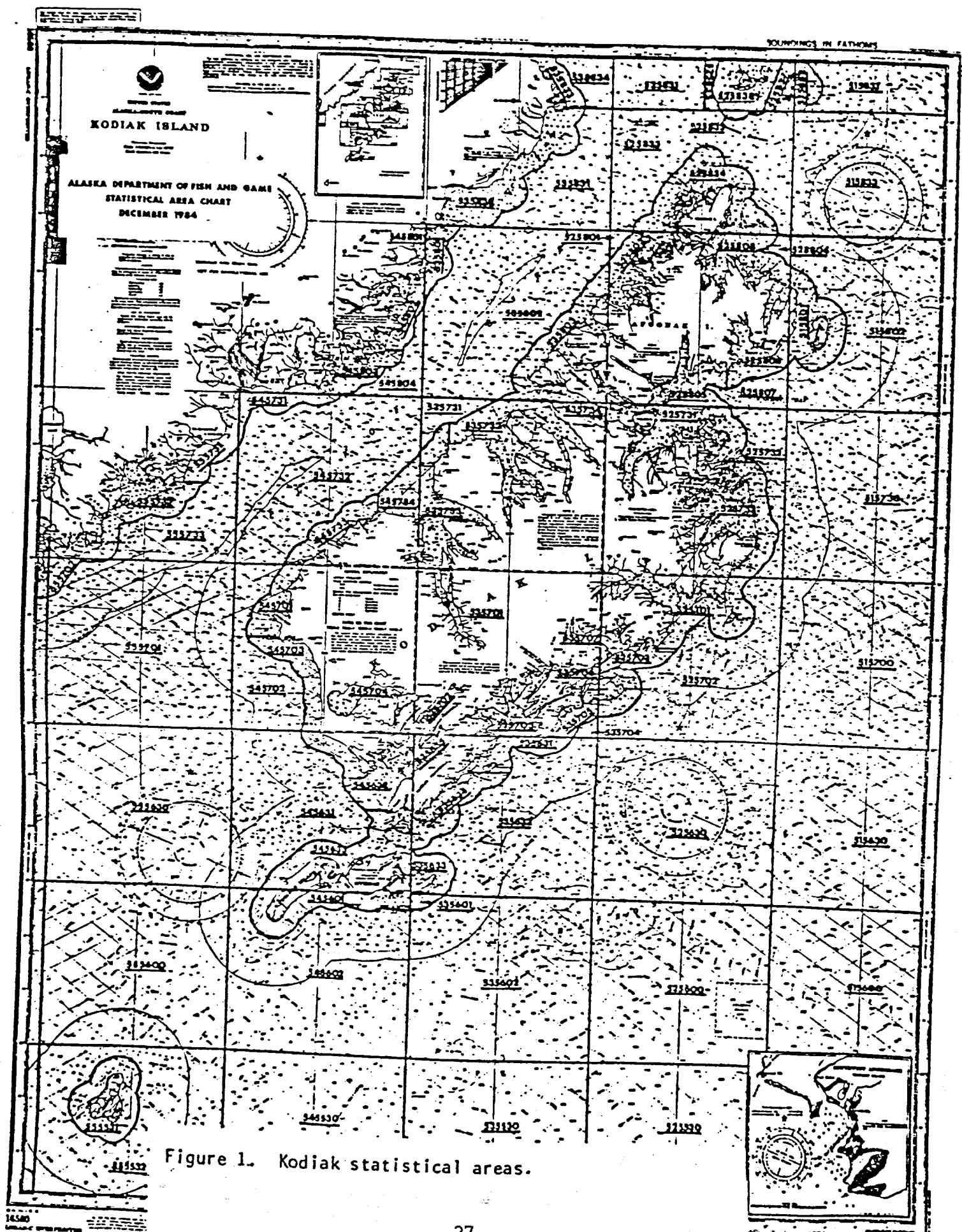
Emergency Order	Effective Date	Explanation
King Crab		
4-S-10-89	September 25, 1989	Closed Kodiak king crab registration area on September 25, 1989.

Table 4. Kodiak Management Area vessel and gear effort by fishery and registration year.

	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	
<u>King Crab 7 inch</u>										
Avg. Pots per Vessel ¹	103	113	114	NF	NF	NF	NF	NF	NF	
Total vessels	161	239	297	-	-	-	-	-	-	
Total pots on grounds	16,583	27,007	33,858	-	-	-	-	-	-	
<u>King Crab 7½ inch</u>										
Avg. pots per vessel ¹	98	104	98	NF	NF	NF	NF	NF	NF	
Total vessels	76	188	203	-	-	-	-	-	-	
Total pots on grounds	6,080	19,552	19,894	-	-	-	-	-	-	
<u>Tanner Crab</u>										
Avg. pots per vessel ¹	121	127	120	127	127	119	109	91	100	
Total vessels	188	221	348	302	214	233	189	176	171	
Total pots on grounds	22,748	28,067	41,760	38,354	27,178	27,370	20,601	16,016	17,100	
<u>Dungeness</u>										
	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>
Average pots per vessel ¹	432	399	508	507	491	437	417	383	424	437
Total vessels	21	50	111	103	106	125	81	45	50	47
Total pots on grounds	9,072	19,950	56,388	52,221	52,067	58,375	33,785	17,220	21,200	20,593

¹Information from interviews at tank inspections

NF = No fishery, season closed



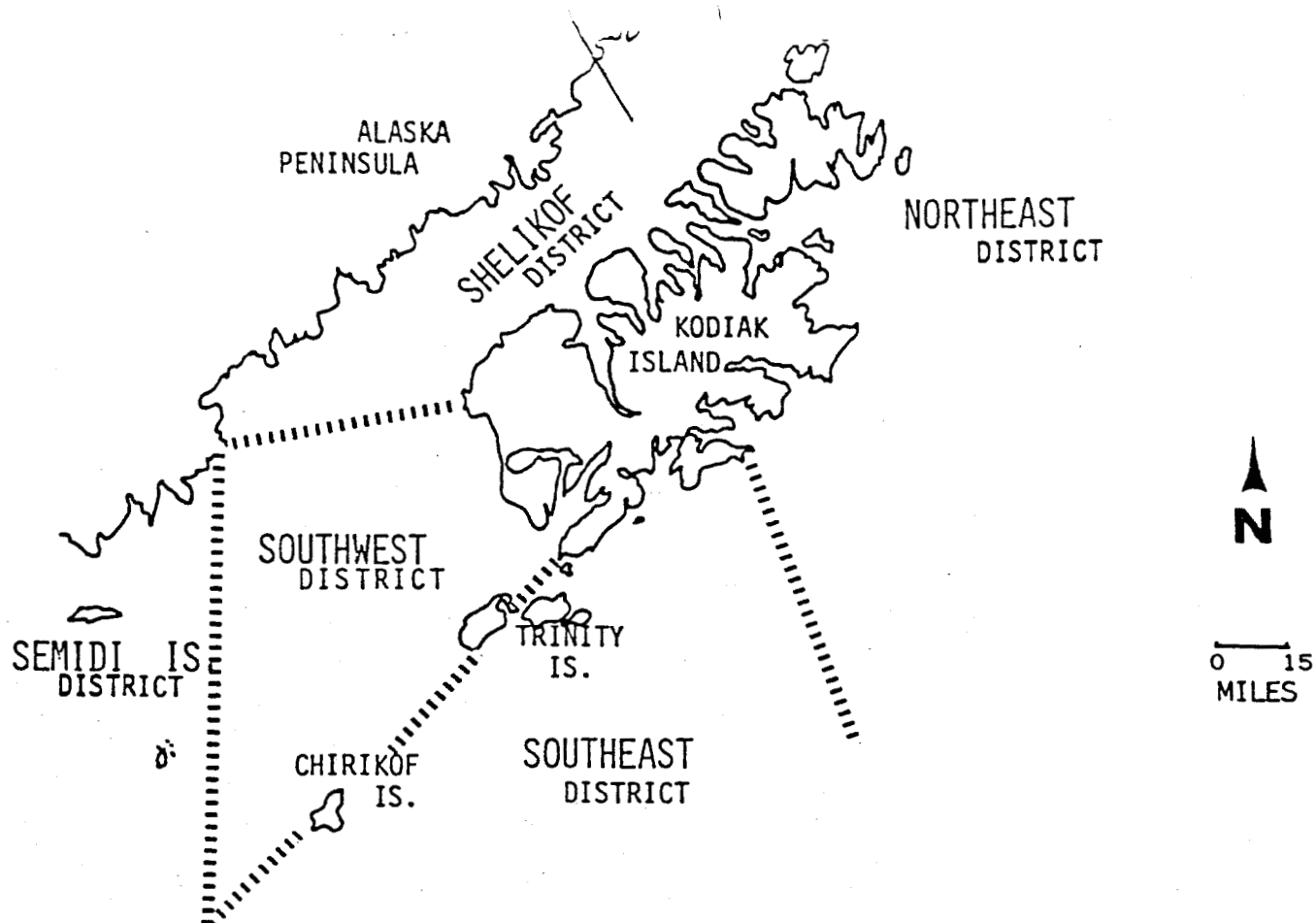


Figure 2. Kodiak (Area K) king crab districts.

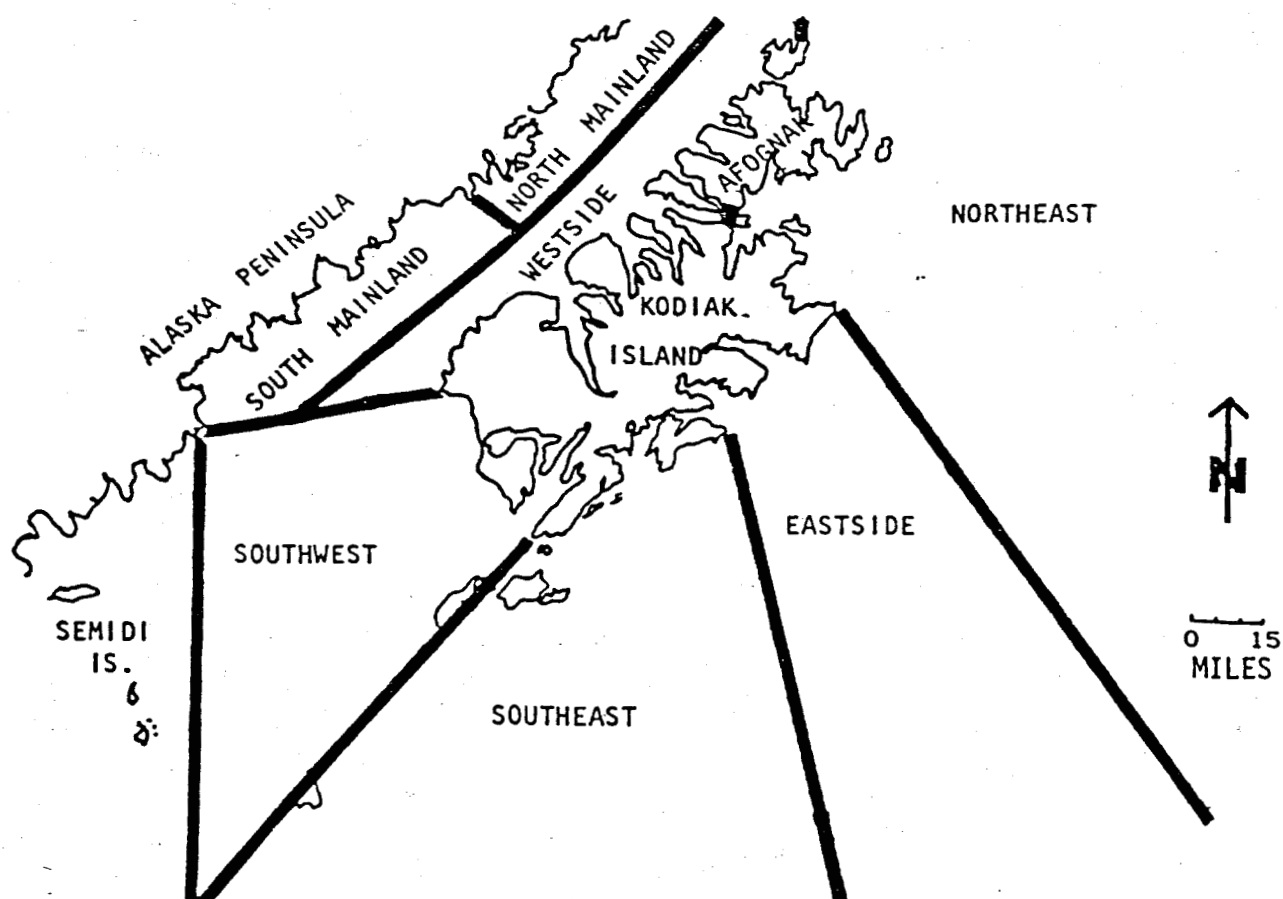


Figure 3. Kodiak District Dungeness crab fishing sections.

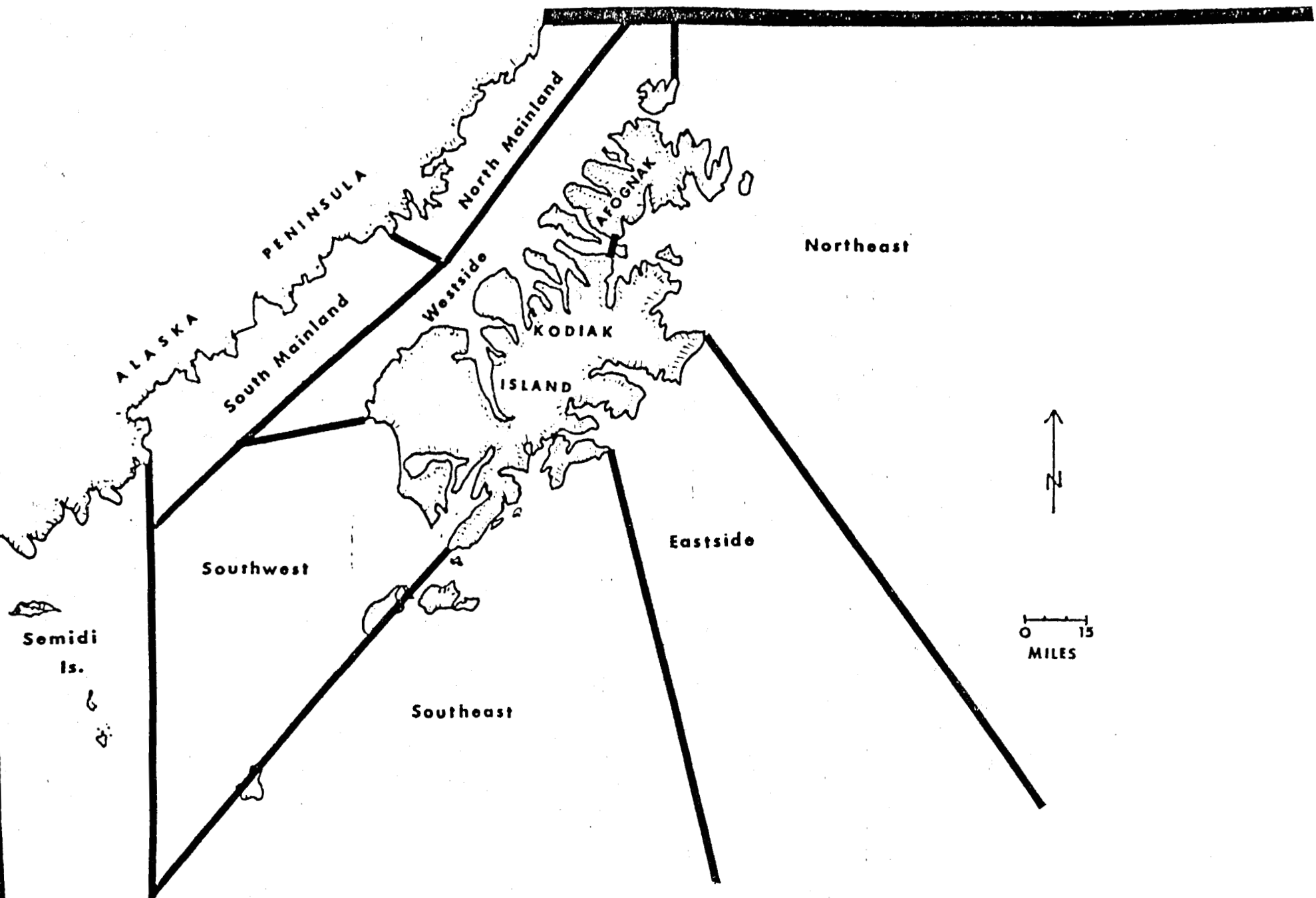


Figure 4. Kodiak District Tanner crab fishing sections.

TANNER CRAB

HISTORIC BACKGROUND

The Kodiak Tanner crab (*Chionoecetes bairdi*) fishery has been in existence since 1967. Through the 1971/72 fishing season the harvest was less than 10 million pounds (Table 1). As king crab abundance declined in the late 1960's and early 1970's, markets opened up, prices increased and more vessels participated in the fishery.

By the 1972/73 season, Tanner crab had established itself as the dominant winter and spring shellfishery. During the 1973/74 and 1974/75 seasons, the first harvest level of 30 million pounds was set by the Alaska Board of Fish and Game as a conservation measure. The low catch of 13.6 million pounds in the 1974/75 season was the result of a prolonged strike. The Board of Fisheries adopted an April 30th closure in 1975 to protect crab at the onset of mating. In 1976 the Board established a 5½ inch minimum size.

In 1978 the Federal government entered into joint management responsibilities with the State of Alaska on the domestic Tanner crab fishery. Federal regulations became effective on December 1, 1978.

The commercial harvest peaked in the 1977/78 season at 33.3 million pounds and declined through the 1980/81 season to 11.7 million pounds. The harvest for 1981/82 was 13.8 million pounds and increased to 18.9 million pounds during the 1982/83 season, but has since declined to current low levels.

1988/89 FISHERY

The 1988/89 Tanner crab season opened at 12:00 noon on January 15, 1989. A total of 171 vessels landed 5,208,999 pounds of Tanner crab (Table 1).

Fishermen settled on a price of \$2.75 per pound. However, by the end of the season fishermen were paid at \$3.05 per pound retroactively.

Tank inspections began on January 14th at 12:00 noon and were given in Kodiak and Old Harbor. Due to poor weather conditions, department personnel were not able to fly to Port Lions and Larsen Bay. Consequently, a resident of each of these communities was appointed to conduct the inspections. Vessel operators were interviewed at the time of tank inspections as to the area they were intending to fish as well as the size and quantity of their gear. The Department estimated 17,219 pots on the fishing ground after the opening.

The Department made a preseason harvest projection of 4.4 million pounds based on trawl survey results. The 1988/89 Kodiak Tanner crab season was characterized by extremely cold air temperatures with high wind conditions. These conditions created wind chill factors of -60°F and below. Fishing effort was limited mostly to daylight hours with many vessels forced to anchor and chip ice.

A harvest projection of 400,000 pounds was made for the Northeast Section. At the start of the season, the Department estimated 3,800 pots on the fishing grounds in the Northeast Section as compared to 4,800 pots during 1988. Catch rates started at 33 crabs per pot and declined to 19 crabs per pot after six days of fishing. During 1988, catch rates started at 22 crabs per pot and declined to less than 9 crabs per pot after six days of fishing.

On January 24th, the Department announced a closure of the Northeast Section for 12:00 noon on January 27th.

The harvest in the Northeast Section was 466,069 pounds landed by 61 vessels with an average catch per pot of 17 crabs overall. Extreme weather conditions prevented the fleet from removing crab pots from the fishing grounds after the closure. Under the authority of 5 AAC 35.050 (3), three additional days were permitted to remove unbaited gear from the fishing grounds.

The Southeast Section was assigned a preseason harvest projection of 900,000 pounds based on survey results.

At the start of the fishery, the Department estimated approximately 4,300 pots on the fishing grounds in the Southeast Section. This compares to an estimated 3,800 pots, or a 15% increase, in the Southeast Section at the start of the 1988 season.

Catch rates started at 57 crabs per pot and declined to 18 crabs per pot after five days of fishing. These catch rates are similar to the 1988 season when catches started at 61 crabs per pot and declined to 19 crabs per pot after five days of fishing.

On January 24th, the Department announced that the Southeast Section would close to Tanner crab fishing at 12:00 noon on January 27th.

A total of 57 vessels landed 1,183,098 pounds of Tanner crab in the Southeast Section with an overall catch per pot of 27 crabs.

Due to severe weather conditions, gear removal was extended three additional days to retrieve unbaited pots from the fishing grounds.

Based on survey results, the Department made a preseason harvest projection of 400,000 pounds in the Eastside Section with approximately 1,800 pots at the start of the fishery.

Catch per pot started at 85 crabs and declined to 22 crabs per pot after six days of fishing. This compares to the 1988 fishery when catch rates started at 15 crabs per pot and declined to less than 10 crabs per pot after three days of fishing.

Although the catch rates of 1989 had increased substantially over those of 1988, the Department chose to close the Eastside Section to allow the Eastside stock to rebuild.

On January 24th, the Department announced a closure of the Eastside Section for 12:00 noon on January 29th.

A total of 24 vessels, with an overall catch per pot of 35 crabs, landed 606,875 pounds of Tanner crab from the Eastside Section.

Due to high winds and severe icing conditions, the fleet was unable to place unbaited gear into storage. The Department authorized an additional two days to remove unbaited gear from the fishing grounds.

The Southwest Section was assigned a preseason harvest projection of 1.4 million pounds. An estimated 5,200 pots were on the fishing grounds at the opening of the season compared to 3,200 pots in 1988.

Catch rates started at 58 crabs per pot and declined to 26 crabs per pot after eight days of fishing. During 1988, catch rates started at 45 crabs per pot and was at 40 crabs per pot after eight days of fishing. On January 26th, the Department announced a closure of the Southwest Section for 12:00 noon on January 31st. This five day announcement was given to allow enough time for the fleet to get crab gear unbaited under severe winter weather conditions. As the closure date drew near, weather conditions worsened to the point that the entire fishing fleet in the Southwest Section was at anchor. On January 30th, the Department issued a second emergency order closing the Southwest Section at

12:00 midnight on January 30th with an anticipated 48 hour reopening when the weather subsided. Baited gear could remain on the fishing grounds but could not be picked until the reopening. This measure was taken to allow an orderly closure to the fishery.

On February 1st, the Department announced the reopening of the Southwest Section for 12:00 noon on February 2nd and to close at 12:00 noon on February 4th.

A total of 31 vessels landed 1,703,723 pounds of Tanner crab with an overall catch per pot of 34 crabs.

The Westside Section was assigned a preseason harvest projection of 300,000 pounds. The Department estimated 1,800 pots on the fishing grounds at the start of the season compared to 3,800 pots at the start of the season in the 1988 fishery.

Catch rates for the first three days of fishing were 37 crabs per pot, but after nine days of fishing, catches dropped to 13 crabs per pot when the season closed.

On February 8th, the Department issued an emergency order closing the Westside Section to Tanner crab fishing at 12:00 noon on February 12th.

A total of 37 vessels landed 206,772 pounds of Tanner crab with an overall catch rate of nine crab per pot.

A preseason harvest projection of one million pounds was made for the North Mainland Section. Initial effort was limited to about five vessels. However, as other sections were closed and weather conditions improved, vessel effort in the North Mainland Section increased.

Catch rates started at 28 crabs per pot and remained at 21 crabs per pot after eight days of fishing. Catches per pot had declined

to 11 crabs by mid-February. Last season's catch rates started at 22 crabs per pot and declined to 11 crabs per pot after eight days of fishing. Catch rates then continued to decline and were below 10 crabs per pot by February 7th.

On February 16th, the Department announced a closure of the North Mainland Section for February 26th at 12:00 noon.

The fishery concluded with 28 vessels harvesting 1,042,462 pounds of Tanner crab with an overall catch rate of 21 crabs per pot.

The South Mainland and Semidi Islands Sections closed by regulation at 12:00 noon on March 31st. Vessel effort for these two sections was four or less vessels and is considered confidential under State law. Catches from these two sections have been included in the total harvest for the North Mainland.

Kodiak District Tanner crab catches are reported by statistical subarea and month. This data is listed in Table .

STOCK STATUS

The Department conducts annual trawl surveys to assess the Kodiak king and Tanner crab populations. This survey was conducted aboard the R/V *Resolution* for a 45 day period between June and August.

Two hundred and twenty-one successful hauls were made capturing a total of 52,150 Tanner crabs. A total of 29,356 male crabs were caught of which 3,462 were legal male crabs and 4,518 were prerecruit-one in size. (114mm-138mm carapace width).

Results of the 1989 survey indicate that there will be no significant increase in legal crab abundance for the next two years (Figure 2).

The Department made harvest projections based on survey results. These harvest projections were based on a 40% exploitation rate for legal male crab in each section. The harvest projections for the 1989/90 Tanner crab fishery are as follows.

Section	Millions of Pounds
Northeast	1.0
Eastside	.9
Southeast	.5
Southwest	.6
Westside	.6
North Mainland	1.1
South Mainland	No Projection
Semidi Islands	No Projection
TOTAL	4.7

Table 1. Commercial catch and effort for the Tanner crab (*Chionoecetes bairdi*), Kodiak Management District, 1967-1990.¹

Year	Vssls.	Lnds.	Number of crab ¹	Number of Lbs. ¹	Pots Lifted	CPUE	Avg. Price Wt. Per #
1967		83		110,961			\$.07
1968		817		2,560,687			.10
1969	85	955		6,827,312	72,748	43	.11
1969/70 ²	67	833	3,237,244	8,416,782	78,266	42	2.6 .11
1970/71	82	453	2,686,067	6,744,163	60,967	44	2.5 .11
1971/72	46	505	3,878,618	9,475,902	65,907	59	2.4 .13
1972/73	105	1,466	13,609,688	30,699,777	188,158	67	2.3 .17
1973/74 ³	123	1,741	11,857,573	29,820,899	217,523	59	2.5 .20
1974/75 ³	74	471	5,459,940	13,649,966	73,826	83	2.5 .17
1975/76 ⁴	104	1,168	10,748,958	27,336,909	199,304	64	2.5 .20
1976/77 ⁵	102	998	7,830,727	20,720,079	164,213	48	2.6 .33
1977/78 ⁶	148	1,483	12,401,243	33,281,472	251,621	49	2.6 .43
1978/79 ⁷	218	1,225	10,702,829	29,173,807	275,455	38	2.7 .55
1979/80 ⁷	211	1,385	6,813,128	18,623,875	282,946	24	2.7 .55
1980/81 ⁸	188	771	4,398,631	11,748,629	174,351	25	2.7 .65
1981/82 ⁹	221	950	5,413,467	13,756,159	230,403	24	2.5 1.65
1982/83 ⁹	348	1,439	7,744,812	18,927,061	377,562	21	2.4 1.25
1983/84 ⁹	303	1,229	5,891,968	14,478,066	303,764	10	2.5 1.20
1984/85 ¹⁰	214	710	4,567,037	12,024,553	176,830	26	2.6 1.50
1985/86 ¹⁰	233	601	3,457,930	8,996,151	160,808	21	2.6 1.90
1986/87 ¹⁰	189	503	1,830,365	4,833,473	110,963	16	2.6 2.62
1987/88 ¹⁰	176	557	1,614,874	3,888,906	101,488	16	2.4 2.40
1989/90 ¹¹	171	567	2,106,320	5,208,999	86,556	24	2.5 3.05
TOTAL	-	-	126,251,379	331,304,588	3,653,657	-	- -
AVERAGE	162	909	6,312,569	14,404,547	173,984	34	2.6 -

¹Data Source: Alaska Department of Fish and Game Annual Board of Fish and Game Reports and Annual Kodiak Area Management Report.

²Fishing Year July 1 - June 30.

³Legal Season November 1 - June 30. Season terminated May 15 due to onset of mating period.

⁴Legal Season November 1 - April 30.

⁵Legal Season January 1 - April 30.

⁶Legal Season January 1 - May 15.

⁷Legal Season January 5 - May 15.

⁸Legal Season January 22 - May 15.

⁹Legal Season February 10 - May 15.

¹⁰Legal Season January 15 - May 15.

¹¹Legal Season January 15 - March 31.

Table 2. Tanner crab, *Chionoecetes bairdi*, catch in pounds by fishing seasons for the Kodiak Management District 1980/81 through 1988/89 fishing season.

Section	1980/81 ¹	1981/82 ²	1982/83 ³	1983/84 ³	1984/85 ⁴	1985/86 ⁴	1986/87 ⁴	1987/88 ⁵	1988/89 ⁶
Northeast	2,389,483	1,160,945	2,832,979	1,845,103	1,063,906	646,120	613,791	566,129	466,069
Eastside	1,310,020	1,362,308	3,124,031	4,460,775	5,070,112	4,137,703	1,814,094	273,821	606,875
Southeast	496,275	549,504	2,371,870	2,290,951	1,977,377	1,660,327	513,058	1,087,096	1,183,098
Southwest	2,544,477	5,188,309	5,587,149	2,240,332	889,176	721,443	475,122	1,143,306	1,703,723
Semidi Is.	1,075,482	1,210,671	907,952	288,998	30,176	40,457	16,336	12,290	*
N Mainland	2,088,933	2,205,260	2,042,885	1,449,068	1,717,556	1,445,135	710,730	388,751	*1,042,462
S Mainland	396,155	260,645	149,419	549,712	123,978	85,163	26,434	5,778	*
Westside	1,447,804	1,818,517	1,910,776	1,353,127	1,151,883	259,803	663,908	411,135	206,772
TOTAL	11,748,629	13,756,159	18,927,061	14,478,066	12,024,553	8,996,151	4,833,473	3,888,906	5,208,999

¹Fishing season January 5 - May 15.

²Fishing season January 22 - May 15, shortened due to price negotiations.

³Fishing season February 10 - May 15.

⁴Fishing season January 15 - May 15.

⁵Fishing season January 15 - March 31.

*North Mainland catch includes South Mainland and Semidi Is. catches to protect vessel confidentiality.

Table 3. Tanner crab catch, landings, vessel effort, catch per pot (CPUE) and catch per month by statistical subarea, Kodiak District, 1988/89. Average catch per pot unstandardized for soak period and gear type.

Stat Area	Vessels	Landings	Pounds Harvested	Avg. Wt.	CPUE	-----Catch in Pounds by Month-----		
						January	February	March
525701	7	12	40,336	2.4	18	40,336		
525703	14	27	343,844	2.3	37	288,224	55,620	
525731	12	29	66,983	2.4	23	66,983		
525733	47	150	342,982	2.5	16	339,280	3,702	
525802	4	6	22,583	2.4	15	15,050	7,533	
525806	4	5	29,895	2.4	22	29,664	231	
535631	16	20	293,022	2.5	34	267,067	25,955	
535632	6	8	142,942	2.5	39	137,566	5,376	
535634	4	4	14,332	2.5	29	14,332		
535703	45	120	682,606	2.5	24	645,666	36,940	
535707	5	10	89,329	2.4	42	86,532	2,797	
535732	19	28	80,670	2.4	7	33,808	46,862	
535733	6	17	28,576	2.4	5	8,542	20,037	
535734	4	4	2,247	2.4	4		2,247	
535801	6	6	36,569	2.4	11		36,569	
535802	13	18	243,705	2.3	21		243,705	
535803	6	10	54,317	2.4	15	34,569	19,748	
535831	16	23	390,818	2.4	24	28,462	354,305	8,051
535832	6	7	74,871	2.5	16	30,739	44,132	
545631	20	34	862,813	2.6	40	701,319	161,494	
545632	26	47	749,973	2.6	32	615,587	134,386	
545802	10	15	201,970	2.5	22	160,114	41,856	
*****	34	50	413,613	2.42	20.2	165,375	187,109	61,129
TOTAL	171	567	5,208,999	2.5	24	3,709,215	1,430,604	69,180

"*" Stat area totals have been combined to protect vessel confidentiality.

PERCENT OF TOTAL CRAB MEASURED

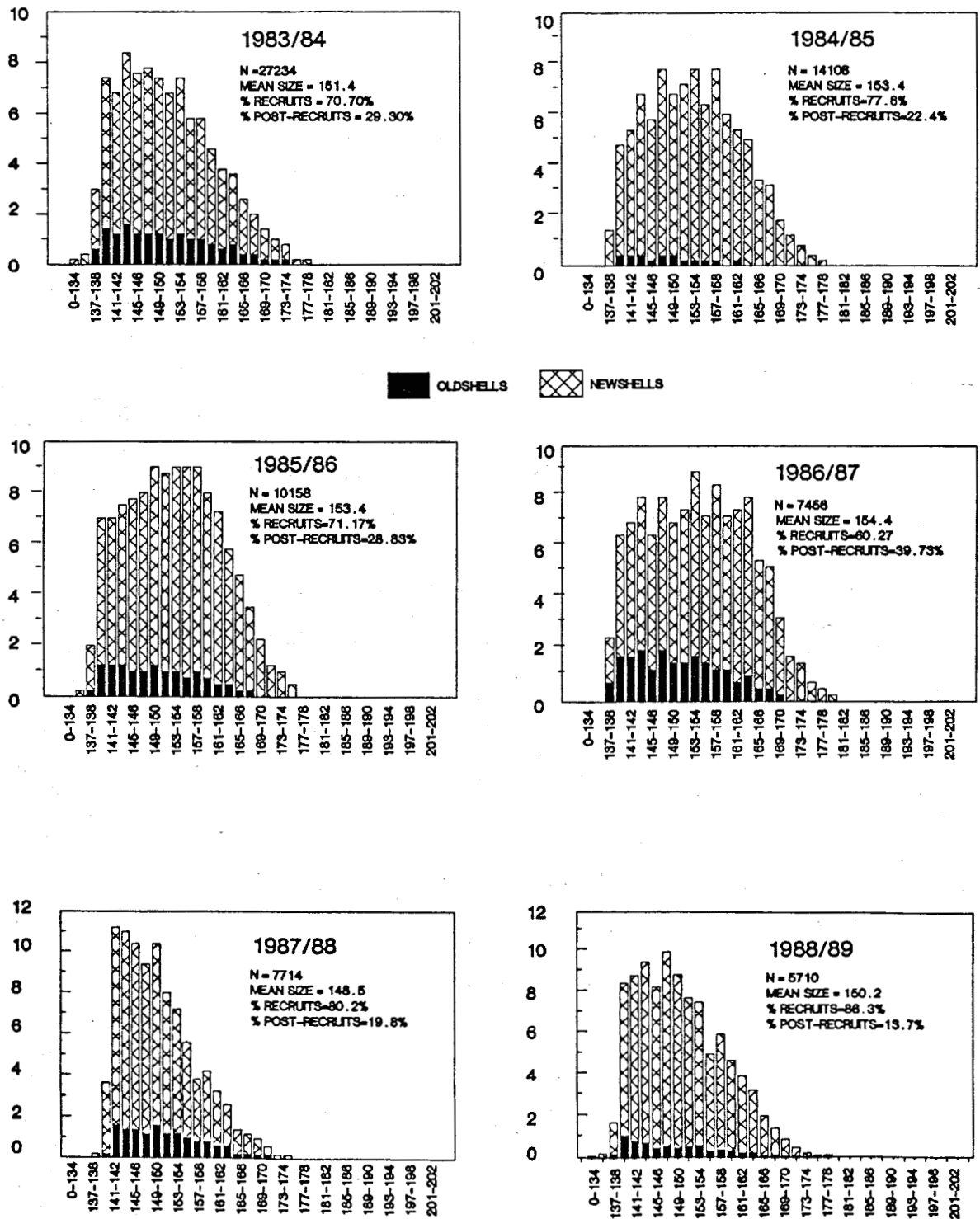


Figure 1. Tanner crab width frequencies from commercial fishery, Kodiak District.

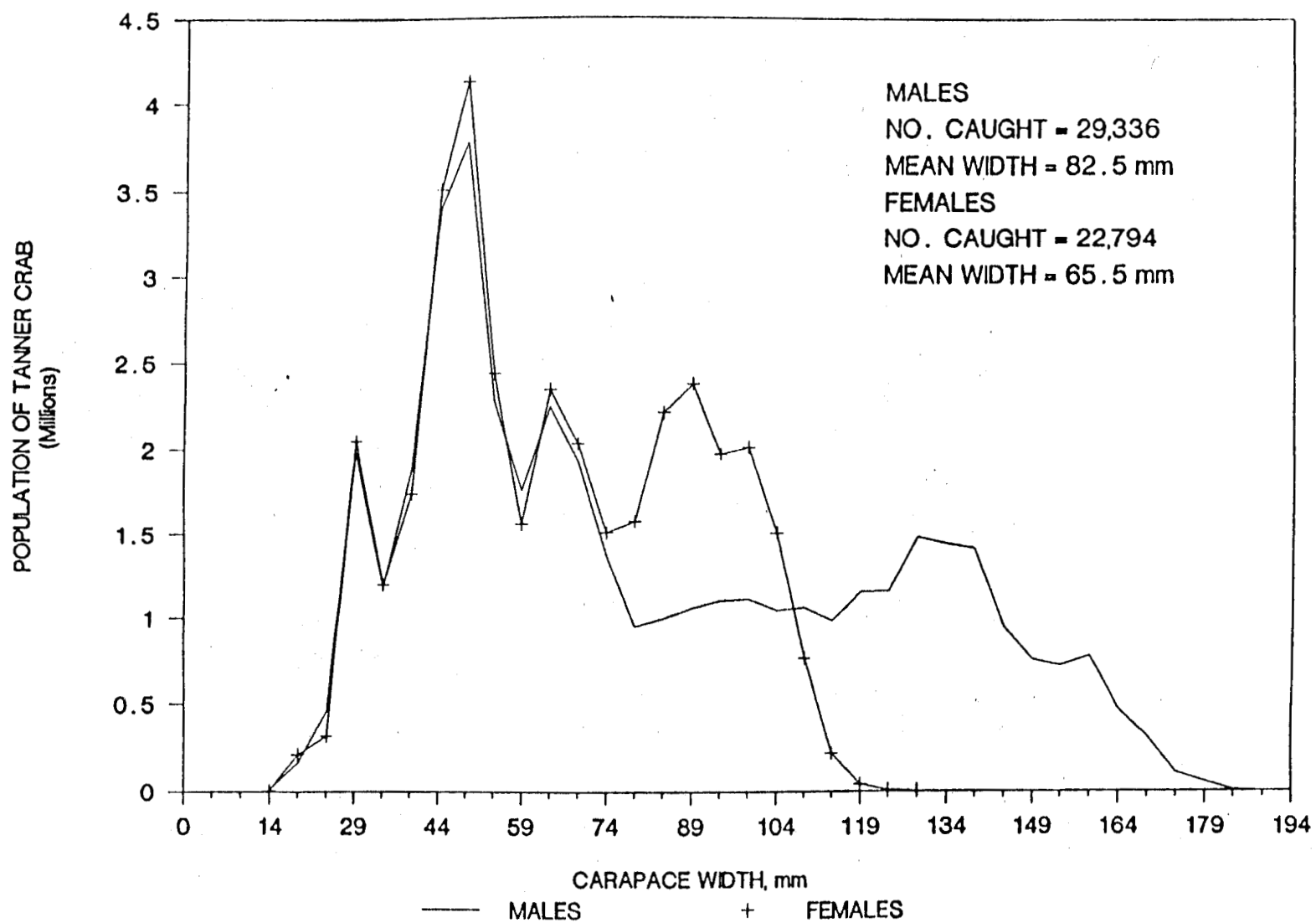


Figure 2. Carapace width frequency of male and female Tanner crab, *Chionoecetes bairdi*, captured during the Kodiak trawl survey, 1989.

DUNGENESS CRAB

Historic Background

The first commercial Dungeness crab (*Cancer magister*) fishery in the Kodiak District was in 1962 with a catch of 1.9 million pounds (Table 1). As a result of favorable market conditions and unexploited stocks, commercial harvest increased to a peak in the four year period from 1967 through 1970 with an average annual harvest of 6.3 million pounds. In 1969 the south end of Kodiak Island (Figure 1) was closed from April 1 to June 15. This was due to the high incidence of female king crab in shallow water during this period of time. During the early 1970's the fishery declined due to biological factors accompanied sometimes by adverse marketing conditions. In the mid 1970's, weak markets and other more lucrative fisheries kept the Dungeness production at a low level. In 1977 the season dates were changed from year around to May 1 through December 31 for the northern portion of the Island. This closure period would require that crab pots be removed from the water and thus would help to reduce the amount of "derelict" gear. Declines in other fisheries and favorable market conditions during this decade have encouraged Dungeness fishing. The 1981/82 harvest of 5.6 million pounds was the largest harvest for the Kodiak area since 1970. Increased effort resulted in the removal of the major portion of postrecruit animals from the stock. As a result production declined to less than 1 million pounds in 1986 for the first time since 1977. The 1987 fishery experienced a modest increase in recruitment as the catch rose with fewer vessels participating. The production in 1988 continued to increase with a large portion of the catch comprised of animals newly recruited to the fishery.

1989 Fishery

The regulatory opening of the commercial Dungeness crab fishing season was May 1 for the north end of the district and June 15 for the south end. Both areas remained open until December 31, 1989. A total of 47 vessels made landings harvesting 3,077,937 pounds of Dungeness crab. The 1989 season catch was valued at 3.4 million dollars with an average ex-vessel price of \$1.10 per pound (Table 1).

The Southeast Section produced seventy-five percent (75%) of the legal dungeness crab landed from Kodiak Island with August being the most productive month. This is the largest harvest on record for the Southeast Section and over twice the harvest of the 1988 season in this section (Table 2).

The Department of Fish and Game operated a dockside interview and sampling program during the season. Approximately 95 interviews were obtained from fishermen landing Dungeness crab throughout the course of the fishery. One thousand one hundred and thirty-three (1,133) crabs were sampled for size and shell condition (Figure 1 and Table 4) with 832 of those also measured for shell hardness (Table 5). The durometer used in measuring shell hardness is being evaluated as a tool to determine molt timing of the Dungeness crab. Ninety-four percent (94%) of the sampled catch was recruit sized animals with a mean width of 178 mm (Figure 2).

Soft and molting crab were reported during the fishery from different areas around the Island. As in the past, the molting activity was sporadic and timing variable from bay to bay. June through August had the highest incidence of soft crab observed.

Stock Status

No assessment of Kodiak Dungeness stocks is conducted independent of the commercial fishery. The 1989 fishery was heavily dependent on recruit sized crab and in the absence of a preseason index survey, a realistic estimate of harvestable stock size cannot be determined. It is expected that the 1990 harvest, again dependent on recruit sized animals, will be similar to the 1989 harvest.

Table 1. Dungeness crab commercial catch and effort by fishing year for the Kodiak Management District, Statistical Area 'J', 1962 through 1989.

Year	Lndgs	Vssls	---Commercial Catch---		Pots Lifted	Avg Lbs Per Lndg	CPUE	Avg Price Per Lb	Ex-Vessel Dollars
			No. Crab	No. Pounds					
1962 ¹	149	-	-	1,904,567	-	12,782	-	\$.09	171,000
1963	354	-	-	2,487,512	-	7,026	-	.09	224,000
1964	395	29	-	4,254,565	-	10,537	-	.09	375,000
1965	351	25	-	3,311,571	-	9,434	-	.12	397,000
1966	144	12	-	1,416,174	-	7,976	-	.13	149,000
1967	439	18	-	6,663,668	-	15,179	-	.13	866,000
1968	536	43	-	6,829,061	-	12,741	-	.14	956,000
1969	455	29	-	5,834,628	190,967	12,823	12	.16	934,000
1970	318	33	-	5,741,438	249,800	18,005	9	.14	804,000
1971	173	24	515,653	1,445,864	90,913	8,358	6	.18	260,000
1972	316	34	766,960	2,059,536	140,921	6,517	6	.40	824,000
1973	487	42	879,484	2,000,526	251,467	4,108	3	.50	1,000,000
1974	172	23	337,839	750,057	104,062	4,361	3	.47	353,000
1975	154	15	307,272	639,813	76,411	4,154	4	.61	390,000
1976	6	4	38,072	87,110	4,410	14,518	9	.15	13,000
1977 ²					Confidential				
1978	173	20	618,357	1,362,306	93,633	7,875	6	.75	1,022,000
1979	237	28	595,850	1,311,275	137,951	5,543	4	.75	943,000
1980	197	21	968,829	2,011,736	107,261	10,212	0	.45	905,000
1981/82 ³	466	50	2,614,545	5,566,463	295,138	11,945	9	.70	3,897,000
1982/83 ⁴	991	111	2,004,075	4,546,311	481,542	4,588	4	.75	3,410,000
1983/84 ⁴	1,079	103	2,044,505	4,752,148	503,464	4,408	4	1.05	4,989,000
1984/85 ⁴	1,163	106	2,393,974	5,303,052	627,441	4,564	4	1.45	7,689,000
1985 ⁵	1,243	125	1,791,446	4,160,435	599,291	3,347	3	1.20	4,992,522
1986	577	81	439,738	967,423	199,881	1,667	2	1.15	1,112,500
1987	379	45	747,117	1,450,983	150,067	3,828	5	1.26	1,828,000
1988	363	50	1,064,387	2,125,114	203,217	5,854	5	1.06	2,253,000
1989	359	47	1,428,973	3,077,937	185,242	8,574	8	1.10	3,385,730
Average	418	43	1,031,758	2,934,796	223,804	8,142	7	\$.54	1,577.741

¹Season open year round 1962 - 1976

²Open May 1 through December 31, 1977 - 1980

³Open February 27, 1981 through February 1, 1982

⁴Open May 1, 1982 through February 1, 1983

⁵Open May 1, 1985 through December 31, 1985

Table 2. Dungeness crab commercial harvest (in pounds) by fishing section, Kodiak Management District, 1981-1989.

Section	1981/82 ¹	1982/83 ²	1983/84 ²	1984/85 ²	1985 ³	1986 ³	1987 ³	1988 ³	1989 ³
Northeast	131,152	363,450	206,386	330,977	346,252	93,428	102,997	149,992	113,211
Eastside	510,826	484,139	437,477	1,332,175	1,564,019	364,635	173,438	177,523	193,200
Southeast	1,194,316	818,825	1,995,363	2,137,968	1,156,447	253,179	751,793	1,126,298	2,323,771
Southwest	280,747	590,498	575,937	204,714	392,233	57,231	84,352	190,280	165,401
N Mainland	1,087,959	855,013	516,289	430,536	342,001	90,783	106,449	97,924 ⁵	*
S Mainland	811,223	577,474	454,646	259,649	37,377	6,222	9,990	*	0
Westside	1,550,240	856,912	564,610	607,033	320,691	101,945	221,964	383,097	282,354 ⁶
Semidi Is. ⁴	0	0	1,440	0	1,415	0	0	0	0
Total	5,566,463	4,546,311	4,752,148	5,303,052	4,160,435	967,423	1,450,983	2,125,114	3,077,937

¹Fishing season February 27, 1981 through February 1, 1982

²Fishing season May 1 through February 1

³Fishing season May 1 through December 31

⁴Area added to Kodiak District by Board of Fisheries, 1983

⁵1988 North Mainland and South Mainland catches combined to protect vessel confidentiality

⁶North Mainland and Westside Section catches combined to protect vessel confidentiality

Table 3.

Dungeness crab catch, landings, vessel effort, catch per pot (CPUE), and catch per month by statistical subarea, Kodiak District, 1989. Average catch per pot unstandardized for soak period and gear type.

STAT	POUNDS AVG.					CATCH IN POUNDS BY MONTH							
AREA	BOATS	LNDGS.	HARVESTED	WT.	CPUE	MAY	JUNE	JULY	AUGUST	SEPT.	OCT.	NOV.	DEC.
525701	9	43	162,957	2.0	4	7,598	14,207	40,074	60,143	21,758	11,172	8,005	
525731	7	14	19,506	2.1	2		353	7,815	5,050	4,432	1,856		
525733	19	137	92,390	2.1	3	3,644	17,900	21,199	25,255	20,892	1,130	2,255	115
535732	8	45	106,089	2.1	5			11,074	24,273	38,503	25,386	3,926	2,927
545601	10	56	1,230,075	2.2	11		67,618	282,346	327,483	313,273	191,386	47,969	
545602	10	52	1,086,770	2.2	10		30,302	216,690	357,881	210,785	122,368	145,429	3,315
545632	6	25	152,789	2.1	6		1,409	37,594	34,276	57,638	17,116	4,756	
*****	14	58	227,361	2.1	5	5,229	4,760	41317	59,132	27,334	56,854	12,232	20,503
GRAND													
TOTAL	47	359	3,077,937	2.2	8	16,471	136,549	658,109	893,493	694,615	427,268	224,572	26,860

*** Stat area totals have been combined to protect vessel confidentiality.

Table 4. Dungeness crab commercial width frequency sampling by fishing section, Kodiak Management District, 1989 fishing season.

Section	Total Sampled	----Recruits----		--Postrecruits--		Mean Width
		Number	Percent	Number	Percent	
Southeast	793	732	92	61	8	179
Southwest	100	95	95	5	5	177
Westside	50	50	100			181
Blank	190	186	98	4	2	175
Totals	1,133	1,063	94	70	6	178

Table 5. Commercial Dungeness crab hardness sampling by month, Kodiak Management District, 1989 season.

	Total Sampled	Number Tested	Average Durometer Reading
August	100	50	87
September	509	259	87
October	250	250	86
November	274	273	87
Totals	1,133	832	87

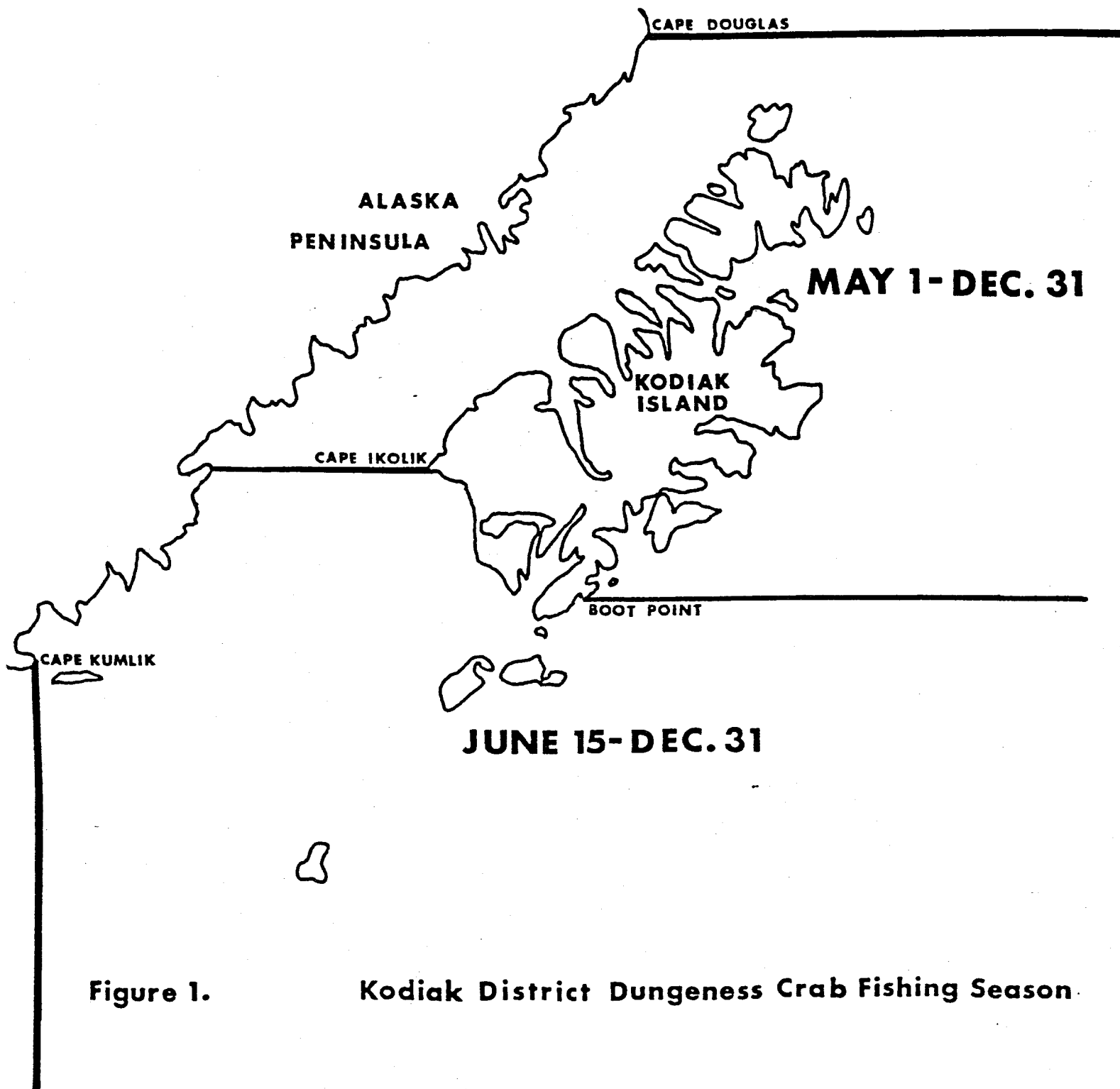
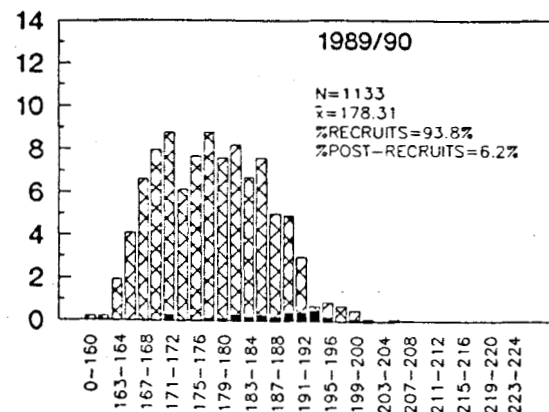
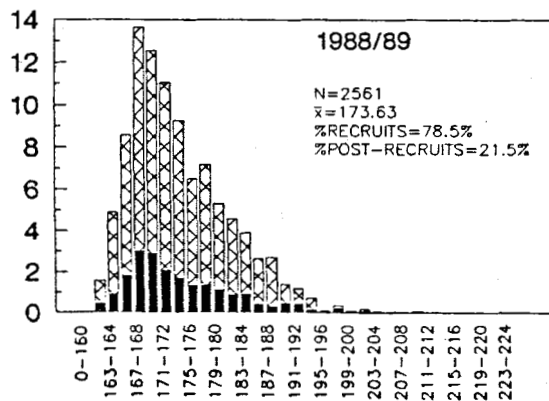
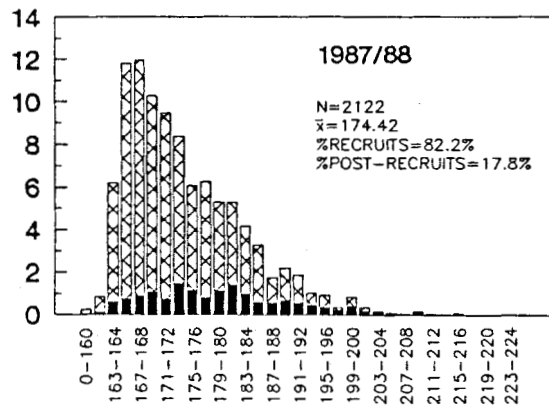
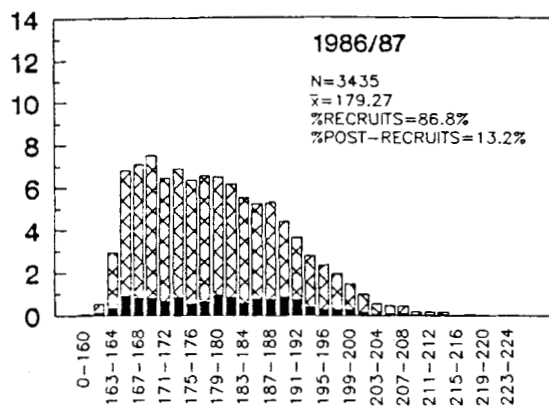


Figure 1.

Kodiak District Dungeness Crab Fishing Season.

PERCENT OF TOTAL CRAB CAPTURED



NEW SHELLS
 OLD SHELLS

Figure 2 Dungeness crab width frequencies from commercial fishery, Kodiak District, 1986/87 through 1989/90 fishing seasons.

KING CRAB

HISTORIC BACKGROUND

The Kodiak king crab fishery was pioneered by salmon fishermen. Beginning in 1936 small amounts of king crab were landed, but catches were not officially recorded until 1950. This period in the history of the fishery was exploratory in nature. Fishermen were locating crab, determining abundance and testing gear types. Once the resource was determined abundant enough to support fishermen, markets had to be developed to sell the product.

During the exploratory period, the Bureau of Commercial Fisheries (now National Marine Fisheries Service) was the management agency. Regulations in effect during this period provided for retaining only males with a minimum width of 5½ inches. In 1949 the size limit was increased to 6½ inches.

In 1950, 60,000 pounds of king crab were landed, and the fishery was on its way to becoming a major force in the economy of the Alaska fishermen. From 1950 to 1959 the catch increased from 60,000 to 21 million pounds. During this period, pots were classified as the only legal gear and area registration was instituted. Also in 1959, the Bureau of Commercial Fisheries transferred management authority to the Alaska Department of Fish and Game.

In 1960 the king crab season opened January 1 and closed December 31. Eight processors bought 21 million pounds of king crab at 8 cents per pound from 106 vessels. The Department of Fish and Game recorded the catches in weight and number of crabs by geographical area. The months of January and February accounted for approximately 50 percent of the harvest. In 1961 the Department recommended that more research was needed to determine the various stocks, breeding habits, age and size of maturity before any more regulations were instituted. In 1963 the size

limit was increased to 7 inches based on Kodiak area growth rate studies and to allow male king crab to breed at least one year before being available to the fishery. The early sixties saw continued growth in the fishery until 1964 when the Good Friday earthquake slowed production. Even with the earthquake, the harvest equalled the 37 million pounds harvested in 1963 (Table 1).

In 1965 a newshell crab closure went into effect from April 1 to June 15. There were 19 shellfish processors in Kodiak paying 10 cents per pound. The Department had completed king crab tagging studies and had defined four major, separate stocks of crab. Fishermen were required to record their catch by statistical area. In 1965 the staff report to the Fish and Game Board stated that the stocks could not continue to support the large harvests that were then occurring. The staff recommended the implementation of a quota system to curtail the harvest. No numbers were provided by the staff and no action was taken by the Board.

The development period which began in 1950 peaked in 1966, when 177 vessels delivered 90 million pounds to 32 processors in a ten-month fishing season. Catches in January and February accounted for 40 percent of the harvest. From 1965 to 1966, vessel effort had increased 7.3 percent, vessel length had increased from 48' to 55', and there were 37 percent more processors. All these factors combined to produce the peak harvest. In 1966 the Department issued the first emergency order to protect newshell and breeding crab and added its first shellfish management position. After examining 12,000 female king crab, of which only three to five percent were barren, the Department stated that Kodiak king crab stocks were biologically sound. After the 90 million pound harvest in 1966, the Department estimated sustained production for the area at 40 to 70 million pounds, with an average harvest of 50 million pounds.

From 1967 to 1970 the king crab fishery expanded to offshore areas, trying to maintain the catch levels of 1965/66. In 1967 the

Department began a test fishing program to locate concentrations of prerecruit crab and to estimate future years' production. The first catch projections predicted a continuing decline in future catches. The 1967/1968 catch dropped to 43 million pounds, 30 million pounds less than the prior year. Also in 1968, females examined from eight different areas showed that 15.7 percent were not carrying eggs.

During the 1968/1969 season the catch dropped to 18 million pounds, and the fishery was closed by emergency order on February 28. The Department determined that in areas with an intensive commercial harvest, there was a higher incident of barren females. No problem was exhibited on Portlock Bank, but on the Chiniak Flats 25 percent of females were barren and large females were affected more than small females. The fishery was still dependent on a weak recruit class.

On July 21, 1970, the Alaska Board of Fish and Game established a catch quota system and directed the Department to institute surveys for abundance estimates. The goals of the policy were twofold:

- 1) Develop and establish a stable fishery, to possibly eliminate extreme fluctuations that had characterized the fishery.
- 2) Develop and maintain a broad base of various age classes, insuring breeding success.

The Department was to present estimates of abundance to the Board, which set the quotas. Quotas were not to be increased unless the Board was notified two weeks in advance. The quotas set by the Board were intended not only to arrest the decline of the king crab fishery but also to return a degree of economic stability and cost effectiveness. Market conditions and the goal of maintaining sufficient densities of crab to provide a reasonable catch per pot were some of the factors taken into consideration. Sometimes these quotas resulted in very low fishing mortalities of 20 to 30 percent

and carried over large numbers of crabs to following years. This stock pile effect caused extremely short, fast paced seasons. Many areas historically fished later in the year were left unharvested. By 1972 the decline had been reversed and harvests started increasing. The 1973 fishery lasted ten days under a fixed quota system. The Southern District was reopened for additional harvest on October 17 and closed October 25.

In 1974 the Board adopted an 8 inch size limit for a second season, as proposed by the Kodiak Advisory Committee. The purpose of the 8 inch season was to provide a harvest opportunity later in the season for areas that had produced larger crab but had not been fished in recent years. Also, the harvests during the 7 inch season were composed of a larger percentage of postrecruit crab because of the restrictive quotas. Many of these crab that escaped the 7 inch season would be lost through natural mortality. Since it was indicated that an increase in harvest could be made, the Board took a cautious approach and decided to increase exploitation on the older postrecruit crab.

The Board also adopted a flexible system of harvest guidelines rather than fixed quotas. The Board directed the Department to continue to manage the fishery using a multi-age-class management strategy based on analysis of crab stocks.

The harvest guideline system provided a more liberal approach to the harvest strategy. During the 1975/76 fishery the Department tried to maximize the harvest within each district by dividing districts into schools and closing each school when a 33 percent fishing mortality was reached based on tag recovery.

In 1976 the Board adopted a fixed opening date of December 1 for the 8 inch season. The December 1 opening date provided an opportunity for all size vessels to participate in the second season. This second season was soon relied on by a large portion

of the fleet, because the additional season allowed a second opportunity to fish and provided an extra stimulus to the local economy.

In 1978 the Board lowered the size limit of the second season from 8 inches to 7½ inches. The Department proposed the change because of the large amount of postrecruit crab available between 7½ and 8 inches that year. The 1978/79 second season recorded a harvest of 1.7 million pounds, similar to the 1.8 million pounds landed in 1977/78. The lowered size limit increased recruit harvest during the second season from .7 percent under an 8 inch size limit to 15 percent the first year that it was in effect (Table 2). In 1981 the Board adopted a management plan for Kodiak. The plan's direction was threefold:

- 1) Individual stocks of crabs are to be managed as a single unit, and small closures that leave a portion of a stock open should be avoided.
- 2) Utilization of stocks based on overall stock size while considering recruitment and postrecruit population levels.
- 3) A second season for 7½ crab will be provided for with an opening between November 15 and December 15. This plan is delineated in detail in 5 AAC 34.460.

The 1981/82 season's harvest was the highest of the previous 14 years at 24.2 million pounds. This was followed by the 1982/83 season harvest of 8.7 million pounds, the lowest in 24 years. Although this 1982/83 season's harvest was low, the value of the fishery was the second highest worth 32.7 million dollars. The effort level for this fishery is also the highest on record with 309 vessels participating.

In 1982 the fleet directed some effort toward brown king crab. There had been incidental catches in the past, but this was the

first directed fishery and produced 25,000 pounds. This interest was encouraged by reduced populations of red king and the high price paid for crab.

In 1983 the traditional red king crab fishery was not opened by the Department of Fish and Game due to poor stock condition. This was a result of poor recruitment for the previous two years combined with continued low recruitment forecast for the next three years. The population of adult male crabs was the lowest the Department had recorded in 13 years of annual population assessments. The Department established threshold levels of legal males needed prior to considering any further fishery. The threshold of 10.3 million pounds of legal crab was nearly twofold the 5.5 million pounds 1983 estimate.

In 1984 the fishery remained closed. The estimate of legal males increased to 8.3 million pounds. Several districts were at, or slightly above, the Department's threshold level. Those districts were not opened due to prospects for continued growth in the near future being dismal, and continued weak recruitment was expected to just barely keep up with natural mortality.

In 1985 the red king crab fishery remained closed. The 1985 crab population assessment survey indicated continued improvement in legal king crab populations in the Southeast and Southwest Districts, while other districts showed little if any improvement. The 1985 survey produced a 9.4 million pound population estimate for the entire Kodiak registration area.

The 1986 survey results indicated a decline in red king crab abundance. The Kodiak area populations of all crab size groups were at record low levels. Although the Southwest District had the highest population of female and legal male crabs, it showed a considerable decline from the 1985 survey. The catch per pot data of the Northeast, Southeast and Shelikof Districts also confirmed this continuation of declining stocks.

Kodiak Island numbers and weights of legal male crabs were calculated using a new method which used commercial catch data from 1973 to 1982 as a basis for the estimates to be compared with the historic survey size and relative abundance data. An estimate of 330,000 legal male crabs was derived for the Kodiak area in 1986 (Table 5).

The commercial fishery did not open during the 1986/87 season. This was the 4th consecutive season that it remained closed.

In 1987 a trawl survey was conducted island-wide for the first time for both king crab and Tanner crab. Previous trawl surveys had been restricted to the Shelikof, Northeast and Eastside areas of Kodiak Island. The survey was conducted aboard the chartered vessel F/V *Royal Baron* and consisted of 188 successful trawl tows. Effort in terms of fishing days, was distributed based on the area's historic commercial production of red king crab and Tanner crab.

Catch data by tow has been presented in a regional report entitled *Alaska Department of Fish and Game Westward Region Crab Survey Results for 1987*. A total of 334 red king crabs, 163 males and 171 females were captured in 25 tows. Fifty-nine percent of all males captured were legal size and 99 percent of all females were adults. Reproductive output of the small adult population remains low as 80 out of 169 adult females were barren.

In November 1988, modified population estimation techniques produced an island-wide population estimate of 548,655 animals. The 1987 survey results indicated a continuation of the decline in red king crab abundance that had been noted during the past five years in all stocks.

This trend continued in 1988 as demonstrated by a Kodiak trawl survey. Two hundred and seventeen tows were made island-wide between July 18 and October 23.

A total of 684 red king crabs, 145 males and 539 females, were captured in 29 tows. The Southwest District produced the highest survey catches with 89 percent of all captured red king crabs coming from that district. One tow in the Alitak Flats area yielded 364 crabs or 53 percent of the total.

The estimated legal sized male population of 110,382 crabs is the lowest level recorded in the history of ADF&G surveys in the Kodiak area.

While increasing in proportion of the survey catch, the estimated number of adult females remained below threshold levels as established in the *Kodiak Red King Crab Management Plan*.

The 1988/89 fishing season was closed by emergency order prior to its scheduled opening.

RED KING CRAB 1989 STOCK STATUS

The 1989 Kodiak red king crab survey was conducted onboard the R/V *Resolution* during June, July and August.

This survey indicated a continuation of the depressed stock status for the Kodiak king crab population. Complete catch by tow information will be available in 1990 in the *Alaska Department of Fish and Game's Westward Region Crab Survey Results*.

A total of 314 king crabs, 219 males and 95 females, were captured during the 1989 survey. The length frequencies of king crab captured in this survey are illustrated in Figure 1. Adult female king crab were checked for clutch size, and these results appear in Figure 2.

The estimated adult female population remained well below threshold levels as established in the *Kodiak Red King Crab Management Plan* (Table 4).

The 1989/90 fishing season was closed on August 15 prior to the scheduled September 25th opening.

THE BROWN (GOLDEN) KING CRAB FISHERY

The brown (golden) king crab fishery in the Kodiak area is a permit fishery. This permit, adopted in 1983 by the Alaska Board of Fisheries, provides the Department the flexibility to avoid conflicts with fair starts in other fisheries, as well as the ability to adjust the permit provision so that it is in the best interest of the industry and the resource.

At the March 1985 Board of Fisheries meeting, the Board reduced the legal size of brown king crab from 7 inches to 6½ inches in width of shell. This regulation became effective on June 28, 1985, the beginning of the new registration year.

The Department does no assessment work on brown king crab, and accurate stock size is unknown. However, the scope of the last six years' commercial effort indicates the resource is not large.

A small amount of brown king crab was harvested in 1989 by less than four vessels (Table 5).

Table 1. Historic commercial king crab catch and effort for the Kodiak registration area 'K', 1960/61 through 1989/90 fishing seasons (fish ticket data).

Fishing Year ¹	Landings	Vessels	No. of Crab	No. of Pounds	Pots Lifted	Crab Per Pot	Average Wt. Per Crab	Price Per Pound	Ex-Vessel Value (Millions)
1960/61	-	143	2,116,375	21,064,871	-	-	-	\$.085	\$ 1.8
1961/62	-	148	3,181,554	28,962,900	-	-	-	.95	2.7
1962/63	-	195	4,146,143	37,626,703	-	-	-	.10	3.8
1963/64	-	181	4,158,988	37,716,223	-	-	-	.10	3.8
1964/65	-	189	4,923,309	41,596,518	95,951	51	-	.10	4.1
1965/66	-	175	11,061,709	94,431,026	173,083	64	-	.128	12.1
1966/67 ²	-	213	8,476,299	73,817,779	223,174	38	-	.11	8.1
1967/68	3,847	227	5,147,321	43,448,492	207,392	25	-	.26	11.2
1968/69 ³	1,839	178	2,348,950	18,211,485	119,146	20	-	.26	4.7
1969/70	978	136	1,606,181	12,200,571	96,841	17	-	.28	3.4
1970/71	830	100	1,561,318	11,719,970	119,192	13	-	.30	3.5
1971/72	507	89	1,539,157	10,884,152	66,166	23	-	.39	4.2
1972/73	683	88	2,029,670	15,479,916	70,806	29	-	.55	8.5
1973/74	837	129	1,847,679	14,397,287	77,826	24	-	.45	6.5
1974/75	1,195	158	2,910,201	23,582,720	110,297	26	-	.45	10.6
1975/76	1,569	169	2,976,909	24,061,651	113,795	26	8.1	.66	15.9
1976/77	1,165	195	2,177,956	17,966,846	130,777	17	8.2	1.37	24.6
1977/78	1,186	179	1,590,477	13,503,666	145,867	11	8.5	1.34	18.1
1978/79	1,077	194	1,464,021	12,021,850	177,261	8	8.2	1.60	19.2
1979/80	1,346	247	1,979,394	14,608,900	207,991	9	7.3	.95	13.9
1980/81	1,175	164	2,787,199	20,448,654	201,531	14	7.3	1.05	21.5
1981/82	2,214	246	3,035,674	24,237,601	388,751	8	8.0	2.00	48.5
1982/83	1,373	309	1,011,109	8,729,761	283,795	4	8.6	3.75	32.7
1983/84			NO FISHERY	- SEASON CLOSED					
1984/85			NO FISHERY	- SEASON CLOSED					
1985/86			NO FISHERY	- SEASON CLOSED					
1986/87			NO FISHERY	- SEASON CLOSED					
1987/88			NO FISHERY	- SEASON CLOSED					
1988/89			NO FISHERY	- SEASON CLOSED					
1989/90			NO FISHERY	- SEASON CLOSED					
AVERAGE	1,359	174	2,963,898	24,834,120	143,813	21	-	-	-

¹Fishing year defined as May 1 - April 30

²July 1 - April 30 season established

³August 15 - January 15 established

Table 2. Kodiak red king crab harvest composition and seasons; 1960/61 through 1989/90 seasons.

Season	Open	Closed	Catch Million Pounds	Percent Recruits ¹	Percent Post- Recruits	Size Limit
1960/61	Jul 1	Jun 30	18.9	8	92	6½"
1961/62	Jul 1	Jun 30	29.0	36	64	6½"
1962/63	Jul 1	Jun 30	37.6	26	74	6½"
1963/64	Jul 1	Jun 30	35.0	33	67	7"
1964/65	Jul 1	Jun 30	41.6	48	52	7"
1965/66	Jul 1	Apr 30	94.4	35	65	7"
1966/67	Jul 1	Apr 30	73.8	28	72	7"
1967/68	Jul 1	Apr 30	43.4	27	73	7"
1968/69	Jun 15	Mar 31	18.2	61	39	7"
1969/70	Aug 15	Jan 15	12.2	59	41	7"
1970/71	Aug 15	Jan 15	11.7	38	62	7"
1971/72	Aug 15	Oct 29	10.9	75	25	7"
1972/73	Aug 15	Oct 13	15.5	47	53	7"
1973/74	Aug 15	Oct 25	14.4	49	51	7"
1974/75	Aug 15	Sep 21	20.9	52	48	7"
1975/76	Oct 15	Jan 15	2.2	3	97	8"
	Aug 15	Oct 20	21.6	48	52	7"
1976/77	Oct 20	Dec 1	2.5	3	97	8"²
	Sep 1	Oct 16	14.6	33	67	7"
1977/78	Dec 1	Jan 15	3.1	.5	99.5	8"
	Sep 15	Nov 30	11.7	37	63	7"
1978/79	Dec 1	Jan 15	1.8	.7	99.3	8"
	Sep 10	Nov 30	10.3	44	56	7"
1979/80	Dec 1	Jan 15	1.7	15	85	7½"
	Sep 10	Nov 30	13.4	70	30	7"
1980/81	Dec 1	Jan 15	1.2	30	70	7½"
	Sep 15	Nov 30	18.4	69	31	7"
1981/82	Dec 1	Jan 15	2.1	22	78	7½"³
	Sep 15	Dec 15	20.3	61	39	7"
1982/83	Dec 15	Jan 15	3.9	7	93	7½"
	Sep 1	Dec 10	7.5	46	54	7"
1983/84	Dec 10	Dec 19	1.2	19	81	7½"
1984/85⁴			F I S H E R Y	C L O S E D		
1985/86			F I S H E R Y	C L O S E D		
1986/87⁵			F I S H E R Y	C L O S E D		
1987/88			F I S H E R Y	C L O S E D		
1988/89			F I S H E R Y	C L O S E D		
1989/90			F I S H E R Y	C L O S E D		

¹RECRUITMENT AFTER 1963 BASED ON 7" SIZE LIMIT.

²MARMOT BAY, CHINIAK BAY AND KUPREANOF STRAITS DID NOT OPEN FOR 8" CRAB.

³UGANIK BAY, KUPREANOF STRAITS, MARMOT BAY, CHINIAK BAY, UGAK BAY, SOUTH SITKALIDAK STRAITS, KILIUDA BAY AND ALITAK BAY DID NOT OPEN FOR 7½" CRAB.

⁴HARVEST OF CRAB BY TEST FISHERY - 33,743 POUNDS.

⁵HARVEST OF CRAB BY TEST FISHERY - 13,393 POUNDS.

Table 3. Legal male red king crab, *Paralithodes camtschatica*, estimates for the Kodiak area.

Year	Estimate in No. of Animals X 10 ⁶
1973	4.874
1974	8.716
1975	7.622
1976	5.191
1977	3.764
1978	2.874
1979	5.629
1980	5.978
1981	5.873
1982	1.883
1983	0.400
1984	0.397
1985	0.418
1986	0.330
1987*	0.177
1988*	0.110
1989*	0.240

*TRAWL SURVEY

Table 4. Adult female red king crab, *Paralithodes camtschatica*, thresholds by district for the Kodiak area (millions of animals).

	Threshold	1988 Trawl Estimate
District 1 (Northeast)	1.93	.062
District 2 (Southeast)	0.72	.002
District 3 (Southwest)	2.28	.005
District 4 (Shelikof)	0.19	.011
TOTAL	5.12	.080

Table 5. Historic commercial brown king crab, *Lithodes aequispina*, catch and effort for the Kodiak registration area 'K', 1983 through 1990 fishing seasons (fish ticket data).

Fishing Year	Landings	Vessels	No. of Crab	No. of Pounds	Pots Lifted	-----Average-----			Ex-Vessel Value (Millions)
						Crab Per Pot	Wt. Per Crab	Price Per Pound	
1983	36	12	16,349	111,398	8,490	2	6.8	3.00	.3
1984	8	6	3,513	22,066	1,950	2	6.3	2.50	.1
1985	19	4	10,005	63,641	2,693	4	6.4	1.95	.1
1986	31	4	21,862	146,478	5,463	4	6.7	3.00	.4
1987	38	5	9,484	67,191	3,187	3	7.1	3.44	.2
1988		Confidential							
1989		Confidential							
AVERAGE	20	5	8,814	59,090	3,181	3	-	-	-

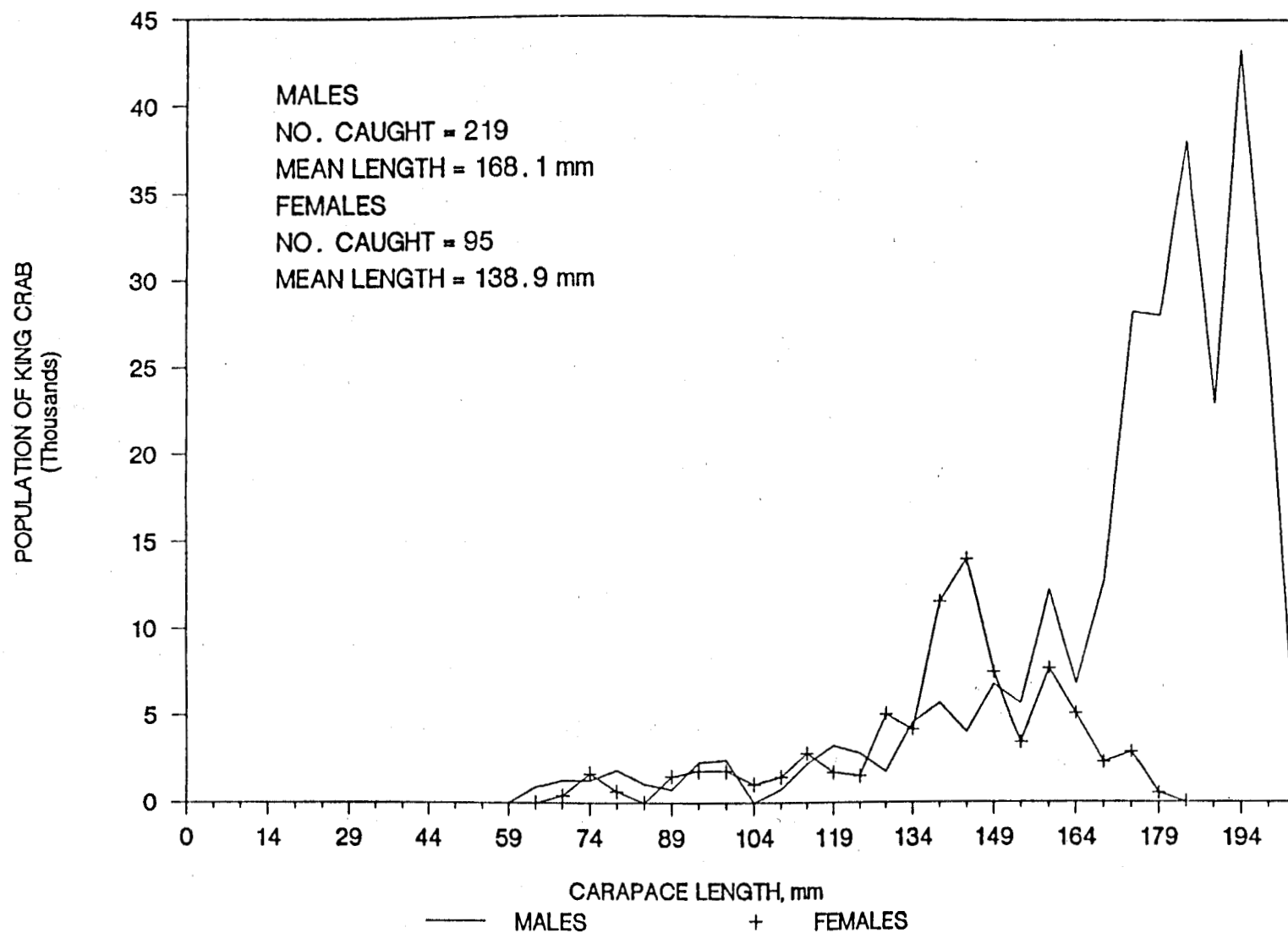


Figure 1. Carapace length frequency of male and female King crab, *Paralithodes camtschatica*, captured during the Kodiak trawl survey, 1989.

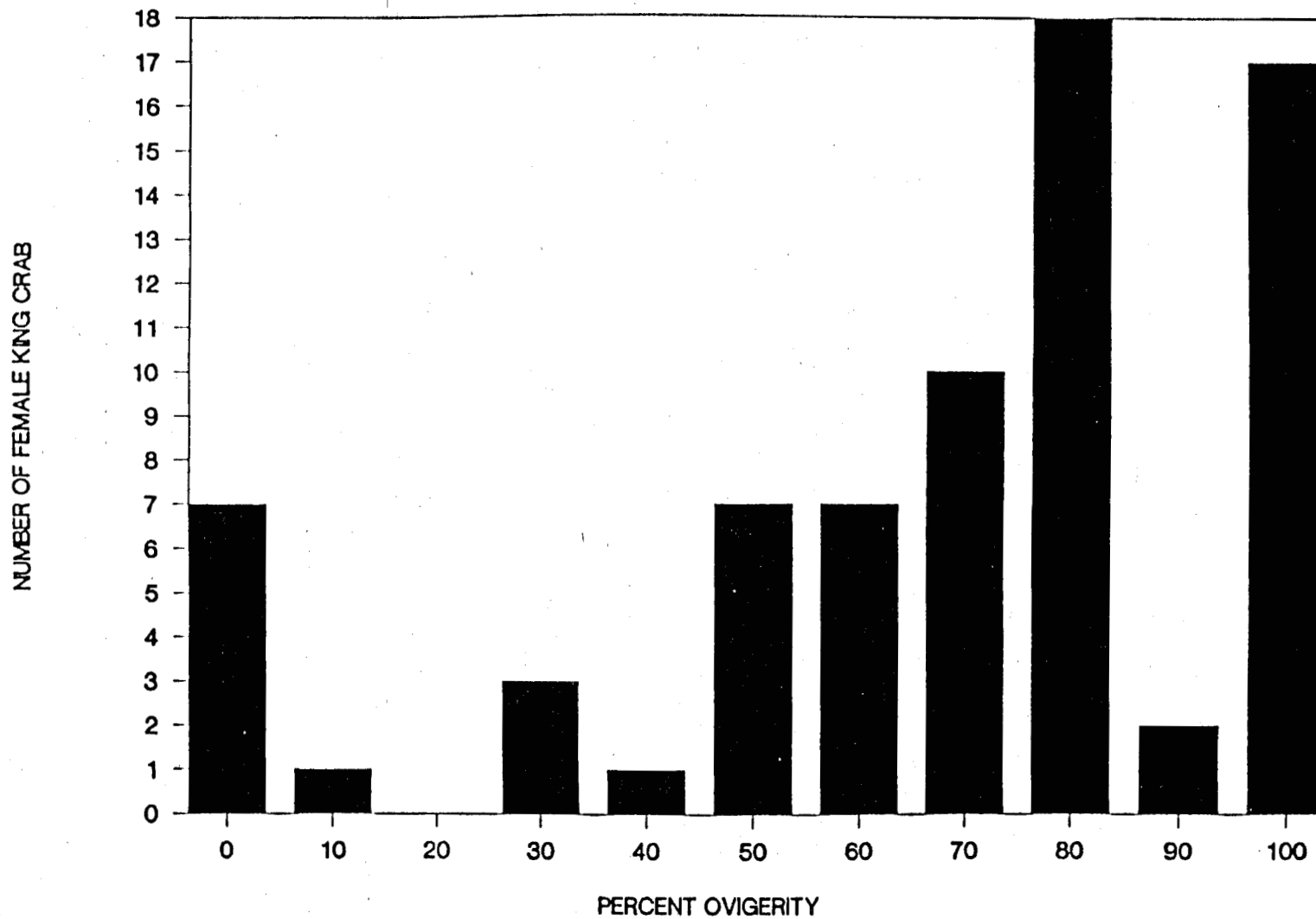


Figure 2. Percent ovigerity of female king crab captured during the Kodiak trawl survey, 1989.

SHRIMP

HISTORIC BACKGROUND TRAWL FISHERY

The Kodiak shrimp fishery began in 1958 with a harvest of 31,886 pounds. The fishery grew rapidly from 10 to 12 million pounds annually in the early 1960's. The fishery slowed when shore plants and the fishing fleet were badly damaged by the 1964 earthquake and tidal wave, but then grew rapidly to a peak of 82.2 million pounds in 1971 (Table 1). As Kodiak shrimp catches declined in the 1970's, much of the vessel effort shifted into the Chignik and South Peninsula areas until those areas too demonstrated similar declines in the late 1970's.

Vessels that have participated in the Kodiak fishery are of three types: vessels that fish with beam trawls, vessels that fish a single otter trawl and vessels that fish two otter trawls simultaneously. The single otter trawl vessels have participated in the fishery since 1958. Beam trawl vessels started fishing in 1970 (F/V *Taurus*, F/V *Sue*). The double rigged otter trawl vessels first fished Kodiak in 1969 (F/V *Pacific Challenger*) followed by more efficient stern ramp double otter trawls in 1970 (F/V *Dawn*). These double rigged vessels increased efficiency; at the same time, hold capacity also increased. Double rigged vessels have hold capacities to 200,000 pounds, while single rigged otter trawls are typically less than 120,000 pounds and beam trawlers typically pack less than 20,000 pounds. The efficiency and ability to deliver larger loads is what enabled the double rigged otter trawlers to range over a much larger area than was customary. Along with the other innovations to the fishery, the double rigged vessel also introduced Gulf of Mexico style nets which were more efficient than the West Coast manufactured nets used previously. These new style nets were quickly adopted by the single rigged vessels. Gear continued to change as new materials and ideas were tried. Wider nets, higher opening nets, different mesh size, longer nets and

roller gear. Along with the increase in gear technology in the 1970's, electronics became more sophisticated and reliable as a tool to locate shrimp.

No regulatory measures were promulgated in the Kodiak shrimp fishery until 1970 when the Board of Fish and Game (later known as Board of Fisheries) adopted an egg hatch closure during March and April for some bays and nearshore areas. In 1971 a quarterly quota system was adopted to provide harvest throughout the year while not allowing unrestricted harvest. The allowable harvest for various fishing sections was divided into four periods. In 1972 the Board of Fisheries adopted a total egg hatch closure for the Kodiak area during March and April. In the late 1970's, the quarterly quota system was reduced to a single opening for certain areas and staggered opening dates for many of the fishing sections, while others retained two fishing periods - fall and winter (September 1 - December 31 and January 1 - February 28). Beginning in 1979, the opening date was changed from May 1 to June 1. Most of the season date adjusting was due to industry's desire to spread harvest out over a longer time period while trying to prevent conflicts with vessels and processing in other fisheries. Also, during this period in the late 1970's, stocks in some areas were not large enough to support fisheries and these areas were opened and closed by emergency order.

The Department of Fish and Game conducted a voluntary logbook program beginning in 1967. This data base plus trawl surveys conducted by the Department since the early 1970's provided means for establishing harvest by the late 1970's. This data base and harvest adjusting system was quite flexible during its developing stage. By 1981 the industry demanded this flexible management scheme be defined. This led to the *Westward Region Shrimp Management Plan* which was presented to the Board of Fisheries in April 1982. This plan was reviewed by the Board and amendments in certain areas were made at the Board's request.

The objectives of this management plan are to maintain shrimp stocks at a level termed "representative biomass" (RBI) determined by survey "index"; while allowing a fishery during rebuilding periods. Exploitation rates increase as the population level approaches or exceeds RBI and decline if the survey index is less than the RBI level. Additionally, a minimum level at which any harvest would occur was established ("minimum acceptable biomass index"). This MABI is 40 percent of the representative index level.

At the same meeting the Board endorsed the *Westward Region Shrimp Management Plan*, they provided for an "economic alternative". This was in the form of an alternative management strategy known as the *Mainland Shrimp Management Plan*.

"5 AAC 31.530. MAINLAND SHRIMP MANAGEMENT PLAN. (a) The Board of Fisheries recognizes that shrimp stocks in the Westward Area have drastically declined in recent years. The board agrees that the conservative management strategy proposed by the department in the 1982 Westward Region Shrimp Management Plan is appropriate, but recognizes that exact parameters governing the selection of harvest levels will probably change as more data becomes available. Alternative management strategies should be evaluated while safeguarding the viability of major shrimp stocks upon which future significant production will have to be based."

(b) The board is adopting this management plan for all waters of the Alaska Peninsula in Statistical Area J from the latitude of Cape Douglas southwest to the longitude of Foggy Cape. These waters include the Mainland section of the Kodiak district and the Aniakchak, Nakalilok and Chiginagak Bay sections of the Chignik district. This management plan will be used to evaluate reactions of shrimp stocks in these

sections to harvest levels and seasons differing from those used in the balance of the region and to provide an economic alternative to the shrimp industry.

(c) The board recognizes that this management plan is not without biological risks to the shrimp resource, but thinks that with proper monitoring knowledge will be gained relative to the reactions of the stock to this management plan and that questions regarding stock distribution and variability will be answered. This will require that the information, including logbooks and accurate catch reporting, provided by the shrimp fishing fleet be of a quality needed to perform this evaluation. Without this information, along with biological surveys conducted by the department, this experimental plan cannot succeed and will be terminated.

(d) The Department is directed not to close the sections covered by this management plan based on any shrimp stock population estimates. The Department may close any section covered by this management plan for the following reasons:

- (1) wastage of shrimp;
- (2) unlawful catch reporting;
- (3) predominant harvest of shrimp less than two years of age; or
- (4) in accordance with 5 AAC 39.185.

Since both of these management plans have been in effect, stocks have continued to decline. Under the *Westward Region Shrimp Management Plan* few areas have been open the past six years. The Mainland fishery, while open, has steadily declined in both production and area fished.

1989/90 TRAWL FISHERY

The trawl fishery opened in the Kodiak District on June 15, 1989. There has been no commercial harvest of shrimp by a trawl during the 1989/90 season.

The areas open to shrimp trawl fishing were the areas under the *Mainland Shrimp Management Plan*, undefined areas and North Afognak (Figure 1).

During 1989 the Department did conduct a trawl survey for shrimp in the Westward Region. Population estimates for each section in Kodiak are listed on Table 2. All sections remained below the level to warrant an opening.

STOCK STATUS

Stocks in the Kodiak District remain at very low levels. There appears to be little if any improvement in stock conditions overall. Areas fished during the previous years (1984-85) have declined to where those managed under the *Westward Region Shrimp Management Plan* were not opened this year. Areas under the *Mainland Shrimp Management Plan*, while remaining open, continue to decline in production.

Until stock conditions improve the Kodiak area harvest in all probability will remain less than one million pounds.

POT SHRIMP FISHERY

Currently, no assessment of stock size or condition is conducted by the Department other than information from the fleet.

A small pot shrimp harvest occurred during 1989. Less than four vessels landed shrimp from the Kodiak area.

Table 1. Historic commercial shrimp catch and effort for the Kodiak District of Westward Statistical Area 'J', 1958 through 1989/90 seasons.

Calendar Year	Fishing Year	Vessels	Landings	Commercial Pounds	Harvest Price
1958		-	-	31,886	\$.035
1959		-	-	2,861,900	.035
1960		11	94	3,197,985	.039
1961		12	203	11,083,500	.04
1962		11	204	12,654,027	.04
1963		-	-	10,118,472	.043
1964		6	-	4,339,114	.04
1965		11	320	13,823,061	.04
1966		17	551	24,097,141	.045
1967		23	-	38,267,856	.045
1968		16	-	34,468,713	.04
1969		26	935	41,353,461	.055
1970		18	1,024	62,181,204	.04
1971		49	1,746	82,153,724	.04
1972		63	1,398	58,352,319	.04
1973		50	1,283	70,511,477	.055
	1973/74	63	1,029	56,203,992	.08
	1974/75	75	1,100	58,235,982	.08
	1975/76	58	884	49,086,591	.08
	1976/77	62	762	46,712,083	.10
	1977/78	58	653	26,409,366	.13
	1978/79	50	328	20,506,021	.165
	1979/80	37	242	12,863,536	.225
	1980/81	67	462	27,101,218	.29
	1981/82	55	298	19,112,367	.27
	1982/83	40	224	10,391,207	.27
	1983/84	14	63	2,779,030	.35
	1984/85	13	59	2,942,922	.33
	1985/86	5	26	1,145,980	.20
	1986/87		Confidential		
	1987/88		Confidential		
	1988/89	0	0	0	.00
	1989/90	0	0	0	.00
Fishing Year Averages		33	556	25,917,820	\$.12

Table 2. Kodiak District shrimp seasons, harvest and effort by section 1989/90 season.

Section	Regulatory Season	Actual Harvest Period	Harvest Goal (millions #s)	Pounds Harvested	1989 Survey Index	Vessels	Landings
Inner Marmot	Opened/Closed by EO	Closed	-	-	.327	-	-
Ugak Bay	Opened/Closed by EO	Closed	-	-	.254	-	-
Kiliuda Bay	Opened/Closed by EO	Closed	-	-	.647	-	-
Two Headed	Opened/Closed by EO	Closed	-	-	.105	-	-
Alitak Bay	Opened/Closed by EO	Closed	-	-	.185	-	-
Olga Bay	Opened/Closed by EO	Closed	-	-	-	-	-
Uyak Bay	Opened/Closed by EO	Closed	-	-	.238	-	-
Uganik Bay	Opened/Closed by EO	Closed	-	-	.475	-	-
W. Afognak	Closed Bottom Trawls	Closed	-	-	-	-	-
N. Afognak	Jun 15 - Feb 28	Jun 15 - Feb 28	*	0	-	0	0
Marmot Is.	Opened/Closed by EO	Closed	-	-	.987	-	-
Chiniak Bay	Opened/Closed by EO	Closed	-	-	.222	-	-
Alitak Flats	Opened/Closed by EO	Closed	-	-	-	-	-
Mainland	Jun 15 - Feb 28	Jun 15 - Feb 28	*	0	-	0	0
Undefined	Jun 15 - Feb 28	Jun 15 - Feb 28	*	0	-	0	0

*No harvest guideline based on survey indexes

Table 3a. Comparison of Kodiak District trawl shrimp harvest by fishing section for the 1978/79 through the 1983/84 fishing season. Sections with no catch are indicated by zero. Where dashes appear, no section existed that year.

Fishing Section	1978/79	1979/80	1980/81	1981/82	1982/83	1983/84
Inner Marmot	473,700	0	0	1,958,074	0	0
Marmot Island	0	0	0	87,408	0	0
Chiniak Bay*	1,163,818	925,388	135,804	2,598,072	0	0
Kiliuda Bay	0	0	0	0	0	0
Two Headed Island	1,600	0	2,141,048	3,043,296	0	0
Southern	3,485,531	-	-	-	-	-
Alitak Bay	-	3,537,017	4,716,875	4,136,381	3,627,209	510,086
Alitak Flats	-	-	-	1,728,553	0	0
Olga Bay	1,794,091	2,259,906	1,164,641	760,179	944,067	820,675
Ugak Bay	0	533,598	1,052,092	104,161	0	0
Uyak Bay	1,003,946	0	426,800	0	0	0
Uganik Bay	367,838	0	0	0	0	0
West Afognak	879,082	478,327	1,177,302	230,582	1,000	20,704
North Afognak	1,149,071	1,430,362	2,204,871	748,639	1,206,275	6,617
Kukak Bay	586,496	534,187	1,167,805	549,323	**	**
Wide Bay	-	1,181,936	977,682	926,158	**	**
Puale Bay	-	1,841,223	663,954	1,597,845	**	**
Mainland	-	-	-	-	3,236,991	1,420,948
Portlock	-	-	-	-	-	-
Non-Section	9,600,848	141,592	11,272,344	643,066	0	0
Totals	20,506,021	12,863,536	27,101,218	19,112,367	10,391,206	2,779,030

*Chiniak and Kalsin Bay combined

**Areas combined in 1982/83 to form Mainland Section

NOTE: This page contains some confidential information not for public distribution.

Table 3b. Comparison of Kodiak District trawl shrimp harvest by fishing section for the 1984/85 through the 1989/90 fishing season. Sections with no catch are indicated by zero. Where dashes appear, no section existed that year.

Fishing Section	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90
Inner Marmot	0	0	0	0	0	0
Marmot Island	0	0	0	0	0	0
Chiniak Bay*	0	0	0	0	0	0
Kiliuda Bay	0	0	0	0	0	0
Two Headed Island	0	0	0	0	0	0
Southern	-	-	-	-	-	0
Alitak Bay	1,474,255	0	0	0	0	0
Alitak Flats	0	0	0	0	0	0
Olga Bay	399,882	1,397 ¹	0	0	0	0
Ugak Bay	0	0	0	0	0	0
Uyak Bay	0	0	0	0	0	0
Uganik Bay	0	0	0	0	0	0
West Afognak	5,209	0	0	0	0	0
North Afognak	0	0	2,000	0	0	0
Kukak Bay	**	**	**	**	**	**
Wide Bay	**	**	**	**	**	**
Puale Bay	**	**	**	**	**	**
Mainland	466,694	918,277	447,675	10,841	0	0
Portlock	-	-	-	-	-	-
Non-Section	596,882	226,306	5,793	-	0	0
Totals	2,942,922	1,145,980	455,468	10,841	0	0

¹Test fishing survey

*Chiniak and Kalsin Bay combined

**Areas combined in 1982/83 to form Mainland Section

NOTE: This page contains some confidential information not for public distribution.

Table 4. Pot shrimp catch statistics, Kodiak District of Statistical Area 'J', 1969 - 1989.

Year	Vessels	Landings	Pounds
1969		Confidential	
1970	-	20	12,302
1971*	-	-	-
1972		Confidential	
1973		Confidential	
1974	6	73	10,336
1975	7	77	12,782
1976		Confidential	
1977		Confidential	
1978		Confidential	
1979		Confidential	
1980	4	25	4,700
1981	4	6	2,511
1982	6	18	9,754
1983	12	31	18,686
1984	6	21	4,361
1985		Confidential	
1986		Confidential	
1987*	-	-	-
1988		Confidential	
1989		Confidential	

**No commercial landings recorded for 1971 or 1987*

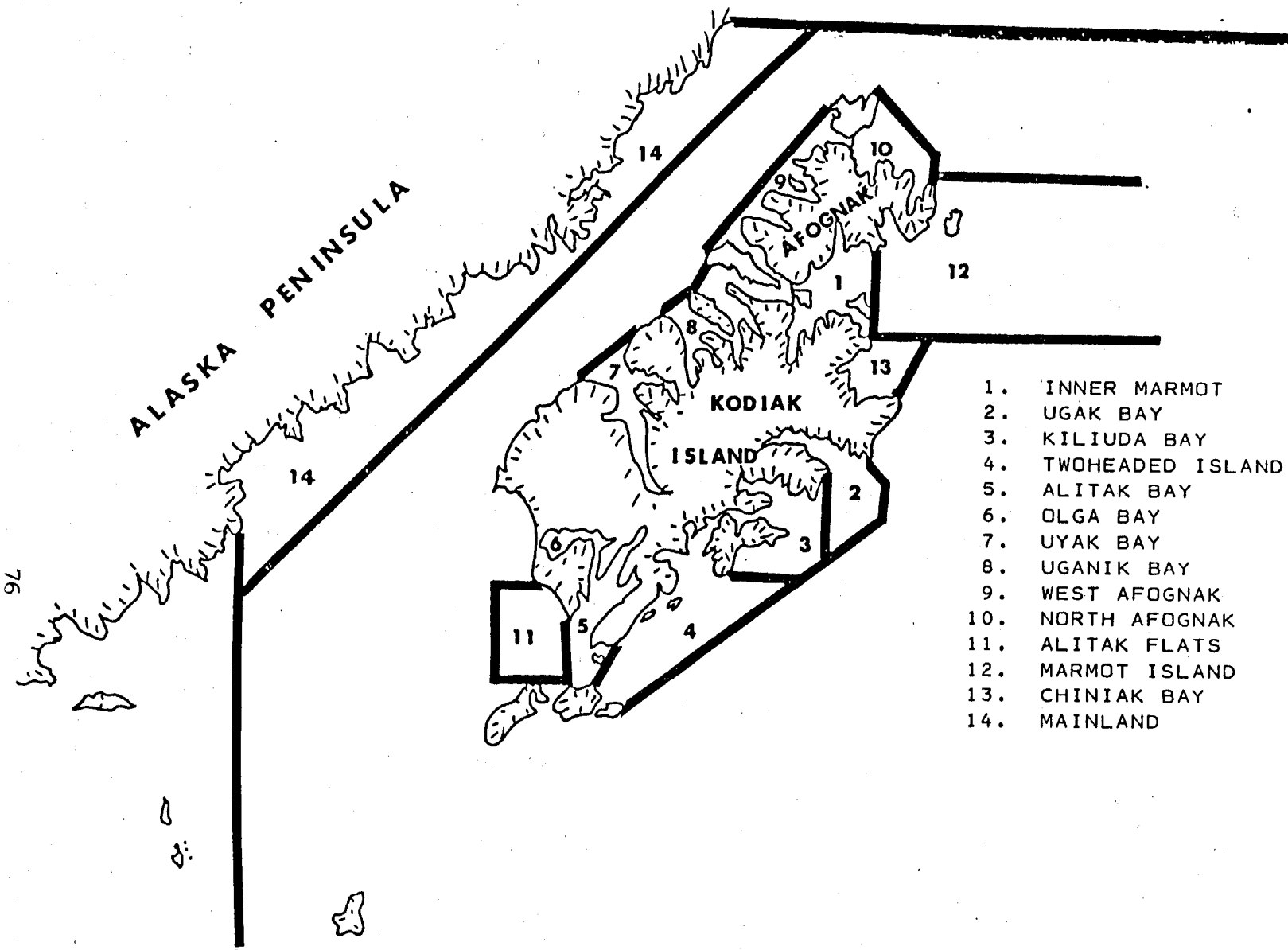


Figure 1. Kodiak District trawl shrimp fishing sections.

THE SCALLOP FISHERY IN ALASKA AND THE WESTWARD REGION

The giant Pacific weathervane scallop (*Patinopecten caurinus*) exists in varying abundance to depths of 100 fathoms (183 meters) in the Gulf of Alaska. Investigations by the National Marine Fisheries Service, the International Pacific Halibut Commission, and the Alaska Department of Fish and Game between 1954 and 1968 showed significant abundances of scallops distributed over wide areas between Cape Spencer and Kodiak Island with sporadic occurrences along the Alaska Peninsula. Commercial size beds appear to occur on sandy-gravel and/or muddy bottom in the 30-70 fathom range (54-128 meters).

The commercial fishery began in 1967 when several vessels explored the east and northeast parts of Kodiak Island and harvested a few thousand pounds of unshucked scallops.

In 1968 the first full year of fishing, 19 vessels (comprised of New England type scallopers, converted Alaskan crab vessels, salmon seiners, halibut longliners and shrimp trawlers) entered the Alaskan scallop fishery. The 1968 catch came from 2 areas with 927,795 pounds harvested from Yakutat and 872,803 pounds in the Kodiak Area of the Westward Region.

The peak harvest of scallops in Alaska totaling 1,849,947 pounds, came in 1969 when 837,087 pounds were taken in Yakutat and 1,012,860 pounds in Kodiak (Table 1).

Kodiak's peak harvest occurred the following year in 1970 when 1,417,612 pounds of shucked meats were landed while the Yakutat catch dropped to only 22,726 pounds.

The statewide harvest declined in the early 70's to an average of 800,000 pounds per year while the highly mobile fleet searched throughout the Gulf of Alaska for unexploited beds.

By the mid-1970's, fishing effort was reduced due to static price conditions, difficulty in gathering experienced crews and the pursuit of more lucrative fisheries by potential scallop vessels.

By 1978 production had further declined to the point where there was no commercial effort in that year.

In 1979 a small fishery resumed with the majority of the catch from around Kodiak Island.

The scallop fishery gained momentum in the early 1980's with the statewide harvest reaching a high of 887,335 pounds in 1981 by a near record 18 vessels. The Westward Region accounted for about half of that production. Since 1982, the Region has contributed the majority of the statewide catch with significant portions coming from previously unexploited scallop beds to the west of Kodiak.

By 1985 emphasis had shifted as far west as Unalaska Island, but recent production has again centered around Kodiak Island. In 1989, the Region catch totaled 464,421 pounds taken by six vessels.

Crab mortality by dredges and trawls has long been a concern of the Department of Fish and Game. In the late 1960's the Department initiated an observer program on scallop vessels to assess the problem. The conclusion of this program was that scallop dredges do catch crab. The mortality rates increased significantly on soft, recently molted crab while areas of schooling crab produced higher catch rates.

These conclusions led to the complete closure in 1969 of certain areas which were a major importance to crab breeding in the Kodiak and Alaska Peninsula areas. In other areas of known crab habitat the season for scallop fishing was set to avoid the crab soft shell period.

The season for Kodiak waters was set at June 1 to March 31 in the north end and Shelikof Strait. Alaska Board of Fisheries action in 1973 set the season at July 15 to March 31 off Kodiak's eastside.

The Alaska Board of Fisheries regulated further closures in the Alaska Peninsula Area in 1984 and around Unalaska Island in 1986 (Figure 1, 2, 3 & 4, Kodiak, Alaska Peninsula, Dutch Harbor and Westward Region scallop fishing closed waters) to protect dwindling crab stocks.

Table 1. Historic catch, effort and value of weathervane scallops, Alaska Westward Region.

Year	Vessels	Landings	Commercial Catch (pounds)	Average Price Per Pound
1967		Confidential		
1968	8	89	872,803 ¹	.85
1969	11	86	1,012,860	.85
1970	7	102	1,417,612	1.00
1971	5	48	841,211	1.05
1972	5	68	1,038,793	1.15
1973	4	42	935,705	1.20
1974		Confidential		
1975	4	30	296,650	1.40
1976		Confidential		
1977	-	-	0	-
1978	-	-	0	-
1979		Confidential		
1980	7	33	371,018 ²	3.60
1981	15	61	441,401	4.00
1982	8	82	641,336	3.25
1983	4	29	191,510	5.00
1984	7	37	309,502	4.00
1985		Confidential		
1986	6	58	587,242	4.25
1987	4	43	583,686	3.70
1988	4	37	302,738	4.00
1989	6	48	464,421	4.06

¹ 718,671 pounds shucked - 154,132 pounds unshucked
² 353,443 pounds shucked - 17,575 pounds unshucked

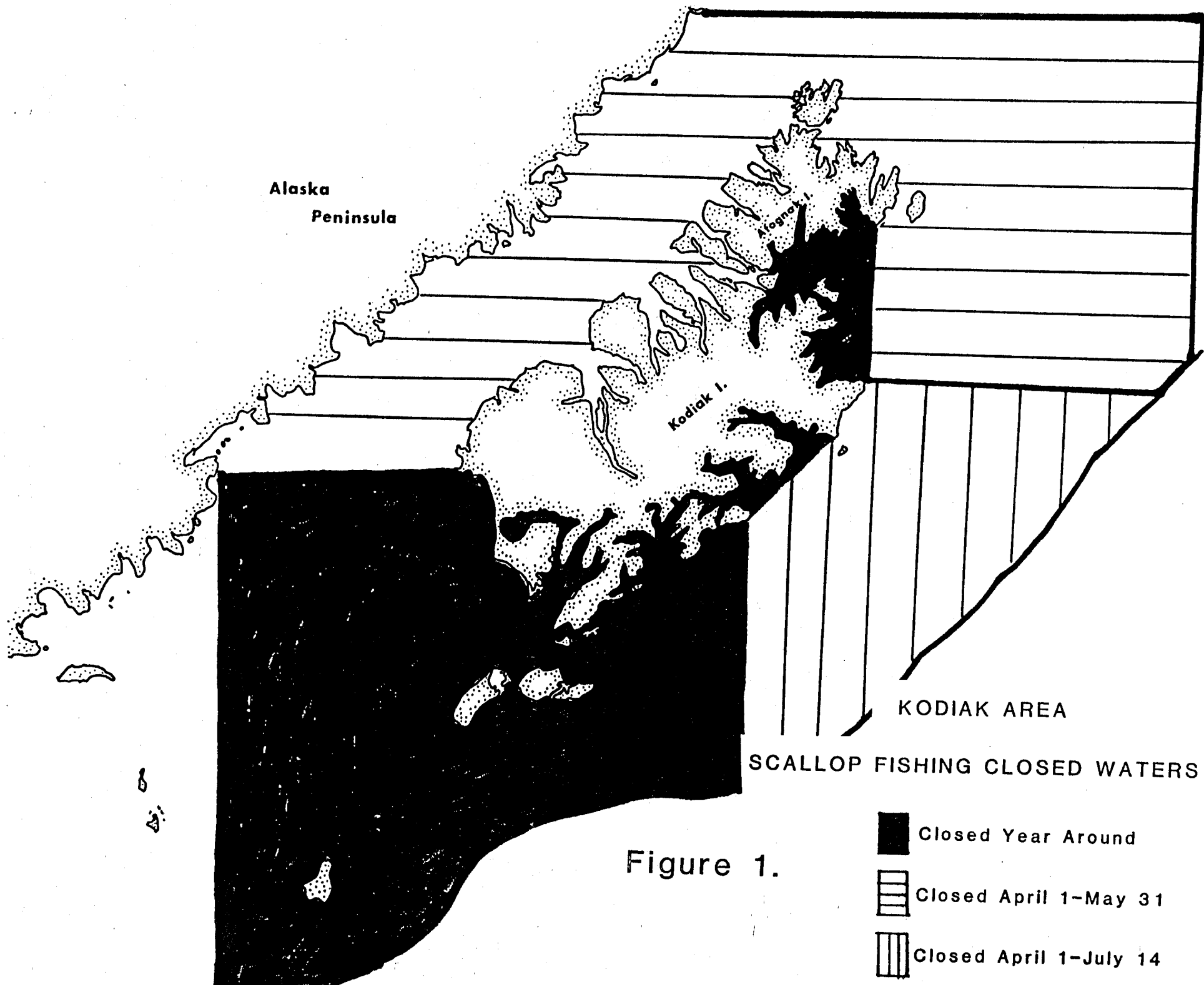


Figure 1.

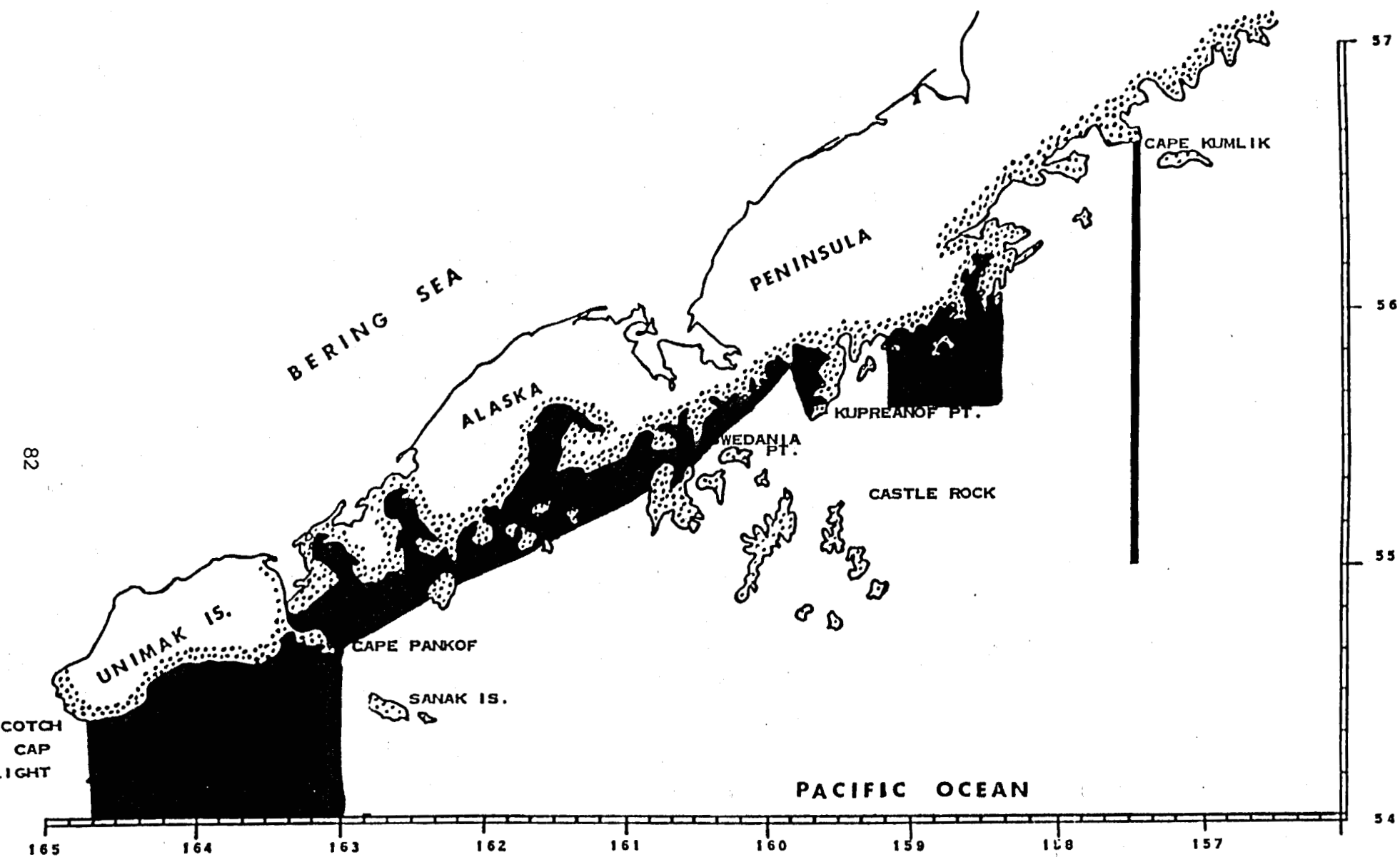
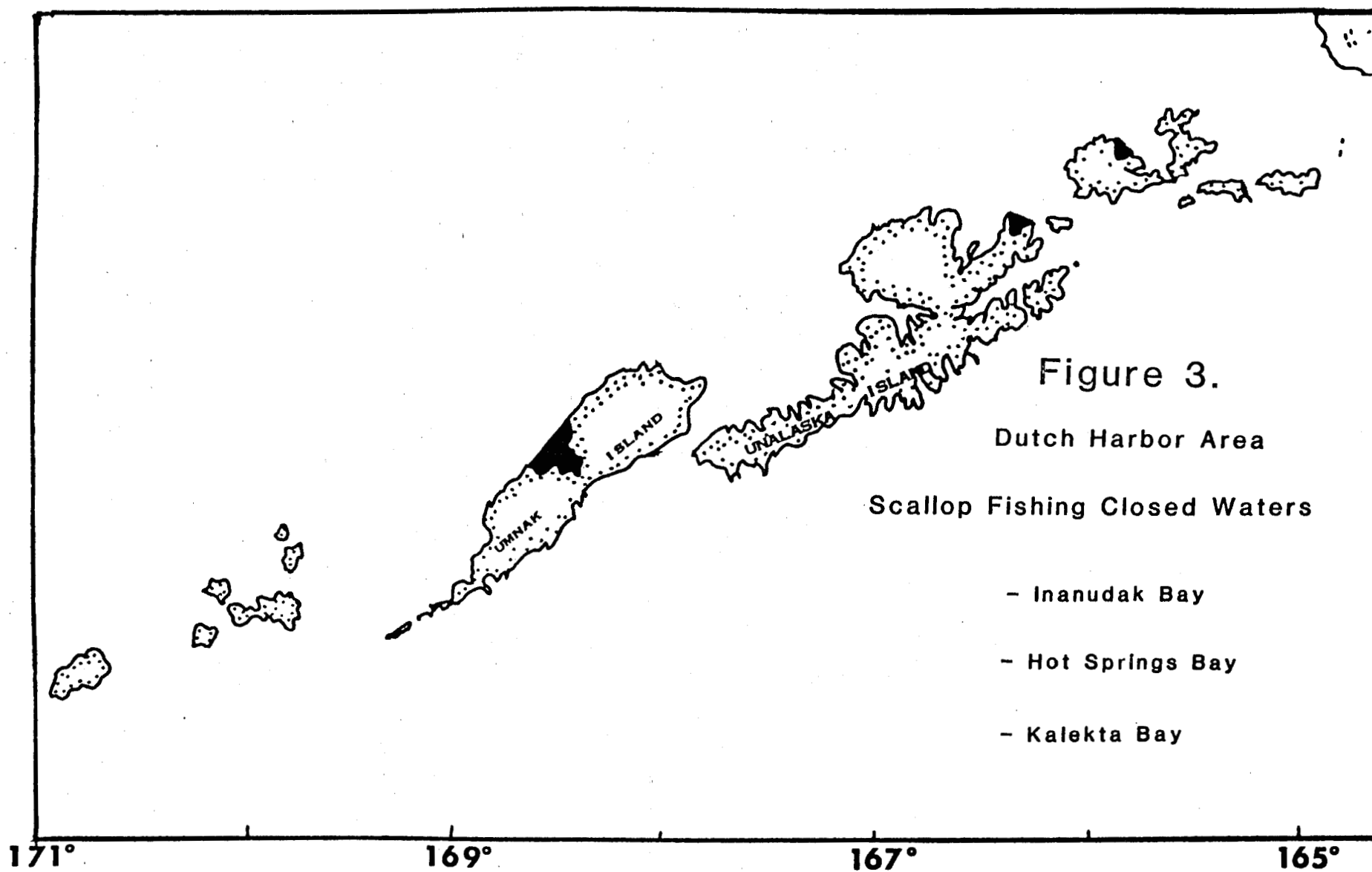
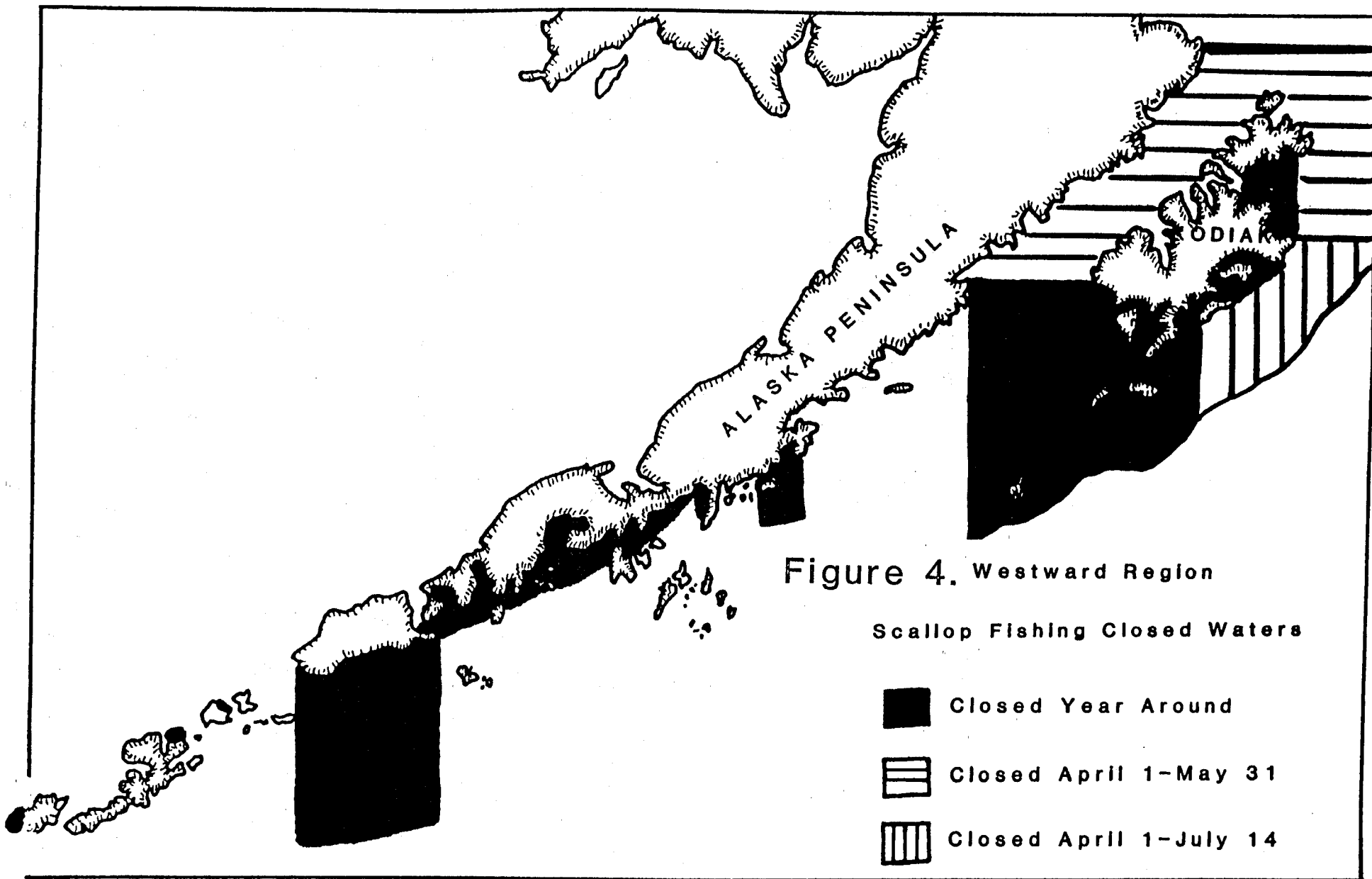


Figure 2. Alaska Peninsula Scallop Fishing Closed Waters





TIME AND AREA CLOSURES TO BOTTOM TRAWLS
WESTWARD REGION

In the late 1970's and early 1980's the increased development of the groundfish fishery led to conflicts with crab as the fishery began targeting hard on the bottom. As early as 1978, the Department was aware of the increasing problem. In 1978, an observer program conducted by the Department in Kodiak indicated that king crab captured incidentally "are greatest from within the bays inhabited by king crabs, particularly during January through June, when crabs are congregated." The observer data indicated an average of 51 king crabs were caught per tow by the American trawlers, while during the same time the foreign trawler observer program indicated an average of one king crab for every 167 tows. The primary difference being the location of fishing. The foreign vessels were restricted to offshore waters where there was a lower density of crab.

In 1983 joint ventures began to target on sole. This further aggravated the problem for two reasons. First, sole are fished hard on the bottom and secondly, they inhabit essentially the same grounds the crab do. Observer data indicates the crab catch increases when the fleet gets on known crab congregating grounds. No data exists which indicates mortality of soft crab caught in a trawl is any different than those caught in a dredge. Additionally, a crab which is not caught but run over by a trawl has a much better chance to survive if it is in a hard shell condition.

In the spring of 1984 the department proposed to the Alaska Board of Fisheries closing sensitive crab habitat during the soft shell period from February 1 to June 1. This was amended and adopted as the Bottom Trawl Fisheries Management Plan. No areas were closed, but one provision of the plan allowed the Department to place observers aboard trawl vessels. An area of critical king crab habitat was described after meetings between the Alaska Department

of Fish and Game and Industry. Vessels could be permitted to fish the area only if an observer from the department was aboard. There was a documented violation of this "Gentlemen Agreement" by a trawl vessel.

Interest in protecting critical crab habitat remained high. In January 1986 the North Pacific Fisheries Council took action to close hard on the bottom trawling from February 15 to June 15 in the Chirikof Island and Barnabas Areas, while the Alitak Flats, Towers and Marmot Flats Areas were closed year round (Figure 5).

At the March 1986 Board of Fisheries meeting, six proposals were presented dealing with trawl closures in the Kodiak area. Adopted were the time and area closures in the Kodiak area. Adopted were the time and area closures presently in regulation. Also closed to bottom trawling were state waters in Area M (the Alaska Peninsula) and some areas around Unalaska and Akutan Islands (Figures 6-9). Further action pertaining to federal waters were taken by the North Pacific Fisheries Council at its December 1989 meeting.

The current time/area closures were renewed for another three years. The existing closures were modified to allow limited expansion of a designated closed area when a significant recruitment even occurs. This additional provision will protect recruiting king crab in areas adjacent to the already closed areas which are known to have contained concentrations of juvenile king crabs or are important migratory pathways during periods of high abundance. These important juvenile crab areas were identified as Type III areas. The current closed areas have also been determined to simultaneously afford a high degree of protection to depressed Tanner crab stocks. The Council has determined that these protective measures is necessary to enhance the opportunity for crab stocks to rebuild in the Gulf of Alaska. The area designations and management actions are as follows:

DEFINITIONS OF CRAB BYCATCH AREAS

<u>Area Type</u>	<u>Name and Definition</u>
I	Type I areas are those king crab stock rebuilding areas where a high level of protection will be provided to the king crab by closing the area year-round to bottom trawling. Fishing with other gear would be allowed.
II	Type II areas are those areas sensitive for king crab populations and in which bottom trawling will be prohibited during the soft-shell season (February 15 - June 15). Fishing with other gear would be allowed and fishing with bottom trawl gear would be allowed from January 1 - February 14 and June 16 - December 31.
III	Type III areas are those geographic areas adjacent to a Type I or Type II area that have been identified as important juvenile king crab rearing or migratory areas. These areas only become operational following a determination that the "recruitment event criteria" has occurred. The NMFS Regional Director will classify the expanded area as either Type I or II depending on the information available.

Areas designated as Type I, II or II are shown in Figure 10.

Another approach to limiting bycatch is the establishment of prohibited species catch limits. Amendment 14, adopted by the North Pacific Fisheries Management Council in 1985 established a halibut prohibited species catch (PSC) framework which has been used annually to determine halibut PSC limits.

In the Gulf of Alaska during the 1990 there will be a 2,000 mt bycatch limit for trawl gear and a 750 mt limit for fixed (pot and longline) gear.

For the Bering Sea, the North Pacific Fisheries Management Council adopted amendment 12a which includes both time/area closures and PSC management measures.

There are two time/area closures in the Bering Sea. Area 512 is closed to trawl gear except for the Port Moller program (for Pacific cod only with 100% observer coverage). Area 516 is closed to trawl gear March 15 - June 15 (Figure 11).

PSC apportionments for the Bering Sea/Aleutian Islands are as follows:

	<u>Zone 1</u>	<u>Zone 2 (1 & 2H)</u>	<u>BSAI-wide</u>
Red King Crab			
DAP flatfish	138,600	--	--
DAP other	11,400	--	--
JVP flatfish	<u>50,000</u>		
Total crabs	200,000		
<i>C. bairdi</i> Tanner Crab			
DAP flatfish	339,600	110,000	--
DAP other	260,400	1,890,000	--
JVP flatfish	<u>400,000</u>	<u>1,000,000</u>	--
Total crabs	1,000,000	3,000,000	
Pacific Halibut			
DAP flatfish		468	567
DAP other		3,273	3,966
JVP flatfish		<u>260</u>	<u>800</u>
Total mt		4,400	5,333

Zones 1 and 2 are shown in Figure 12.

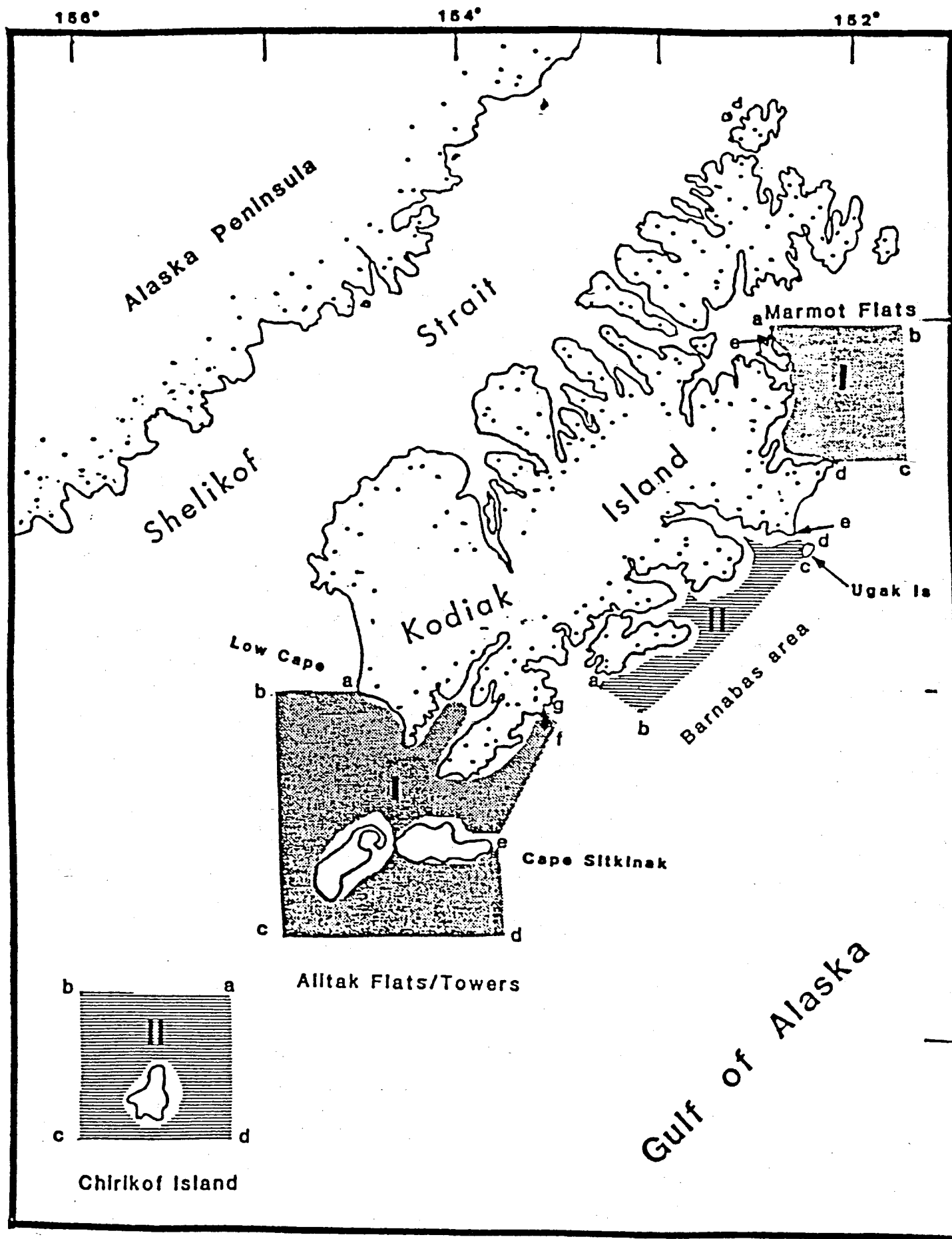


Figure 5--Areas around Kodiak Island closed to trawling, except with pelagic trawls. TYPE I areas are closed year round. TYPE II areas are closed February 15 to June 15. See Section 672.24, Gear Limitations for coordinate descriptions.

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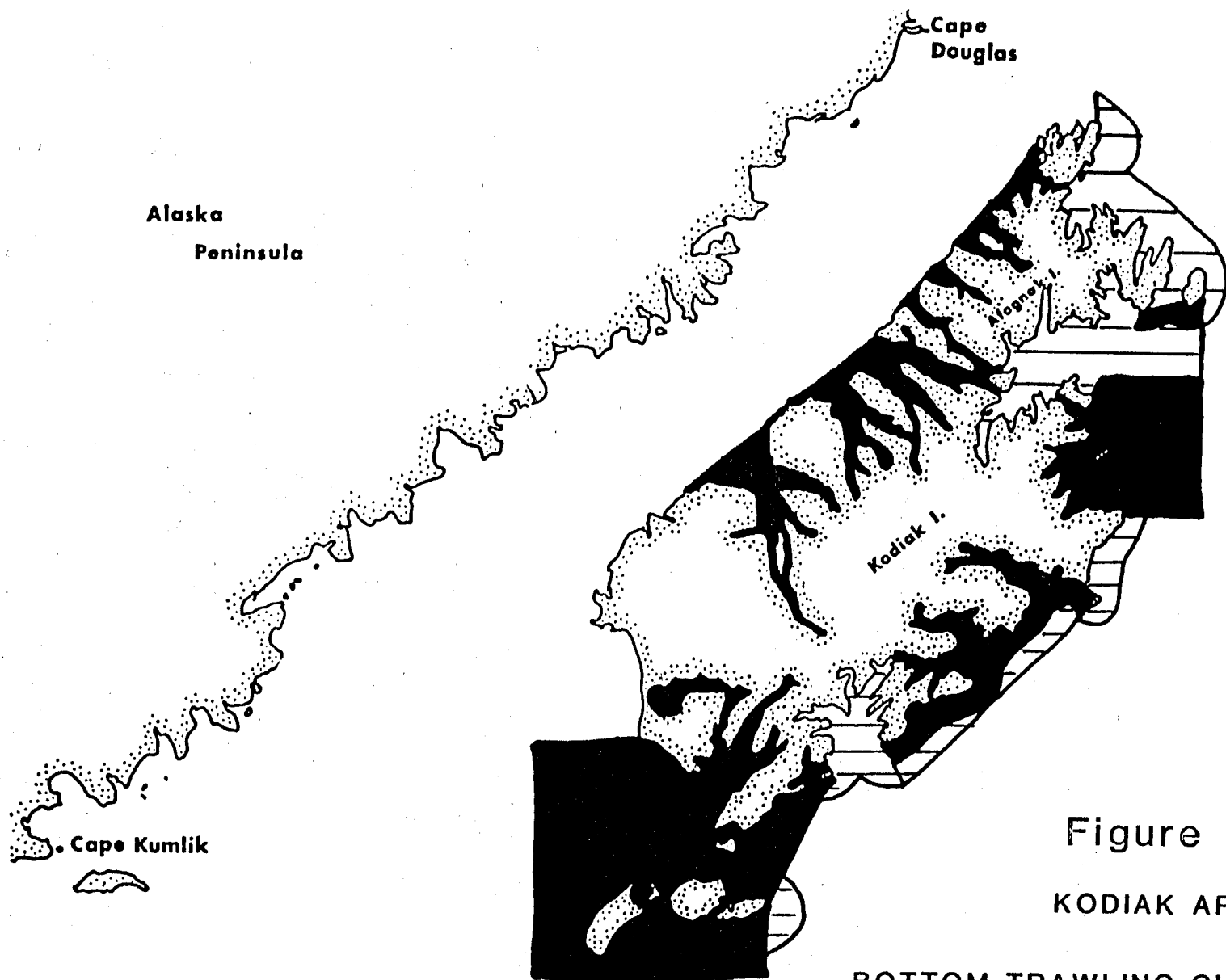
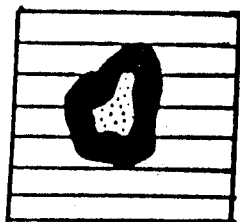
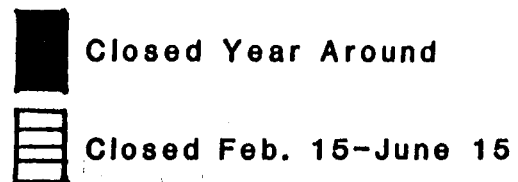


Figure 6.

KODIAK AREA

BOTTOM TRAWLING CLOSED WATERS



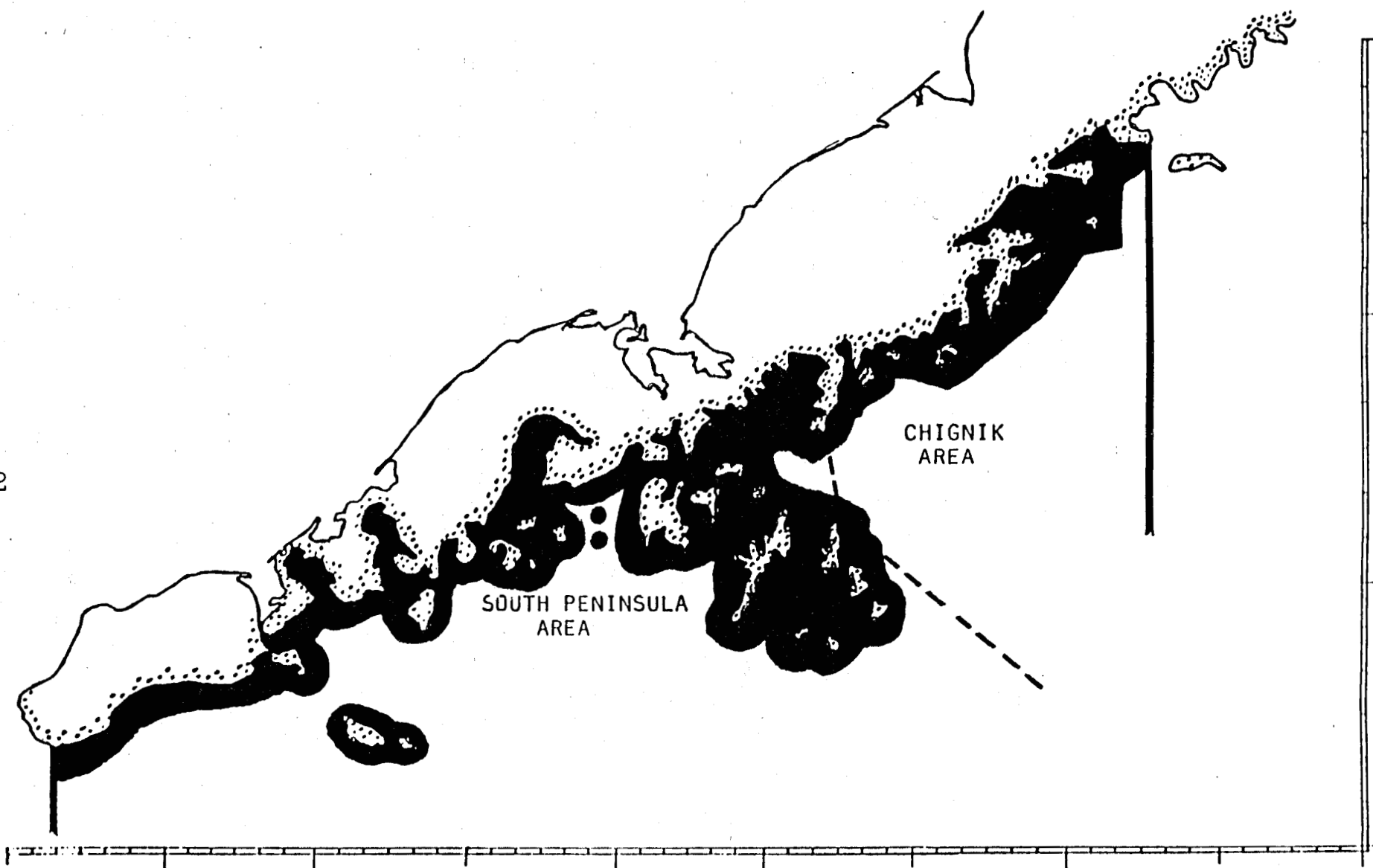
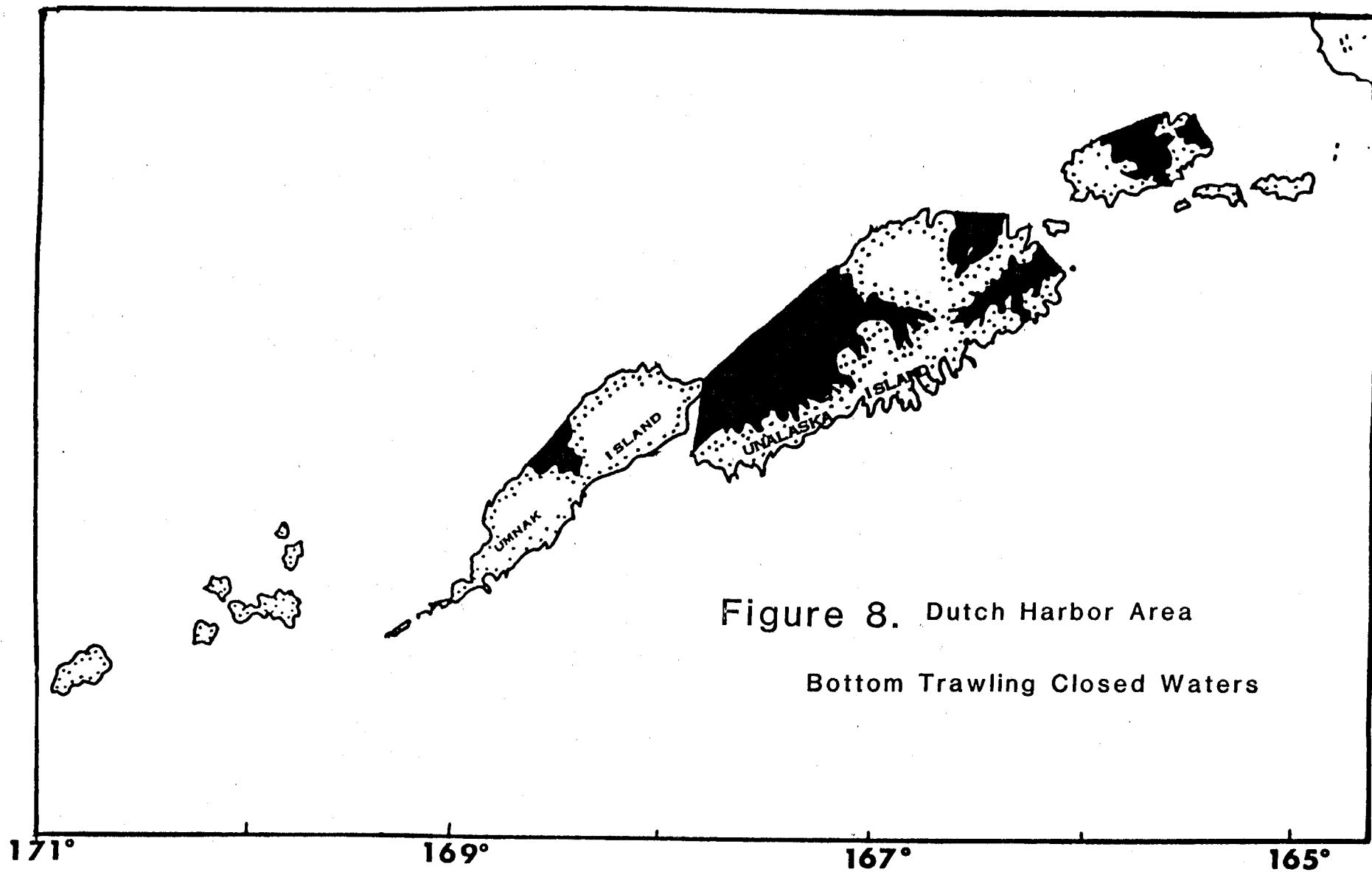
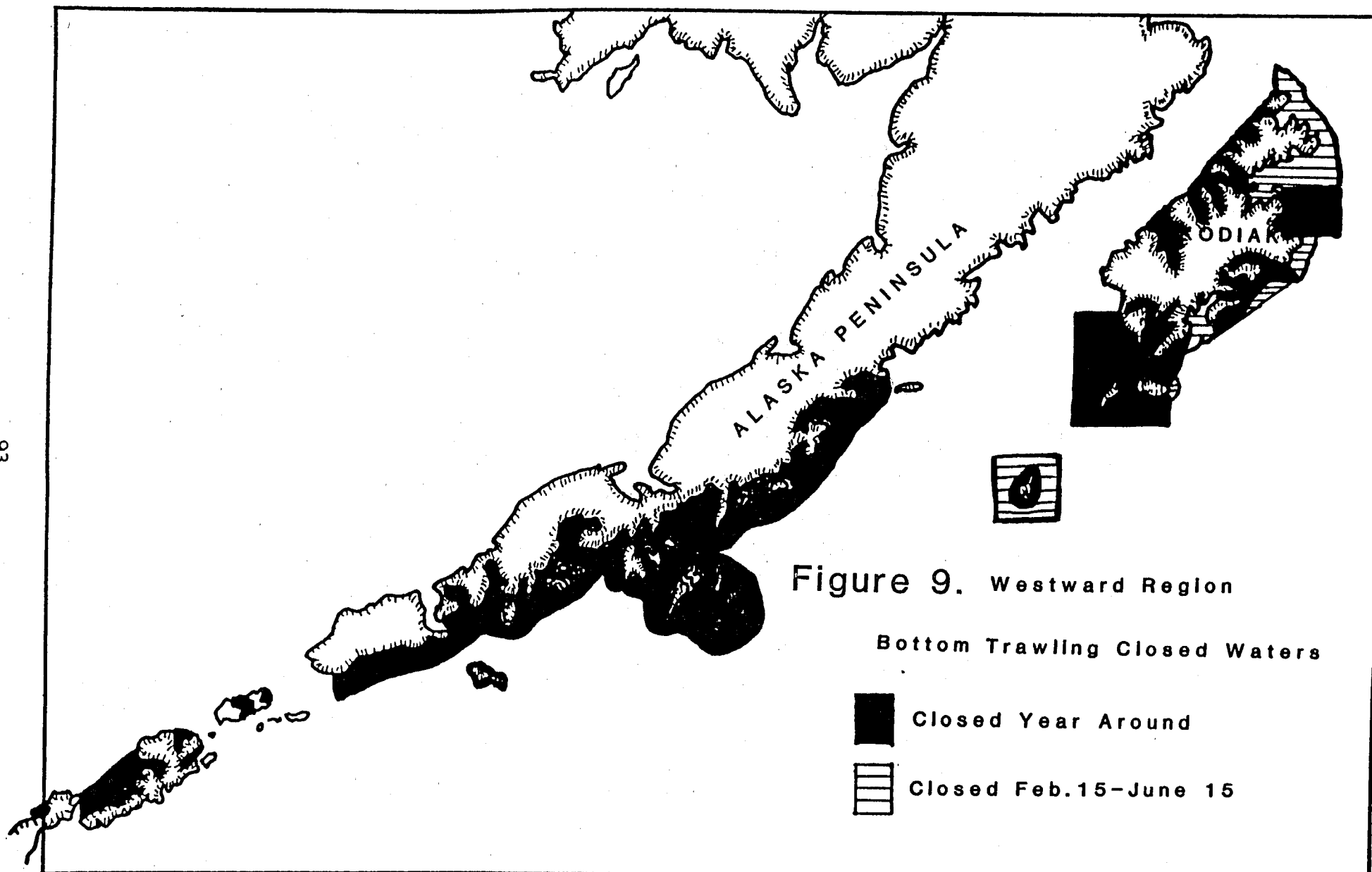


Figure 7. Alaska Peninsula Bottom Trawling Closed Waters





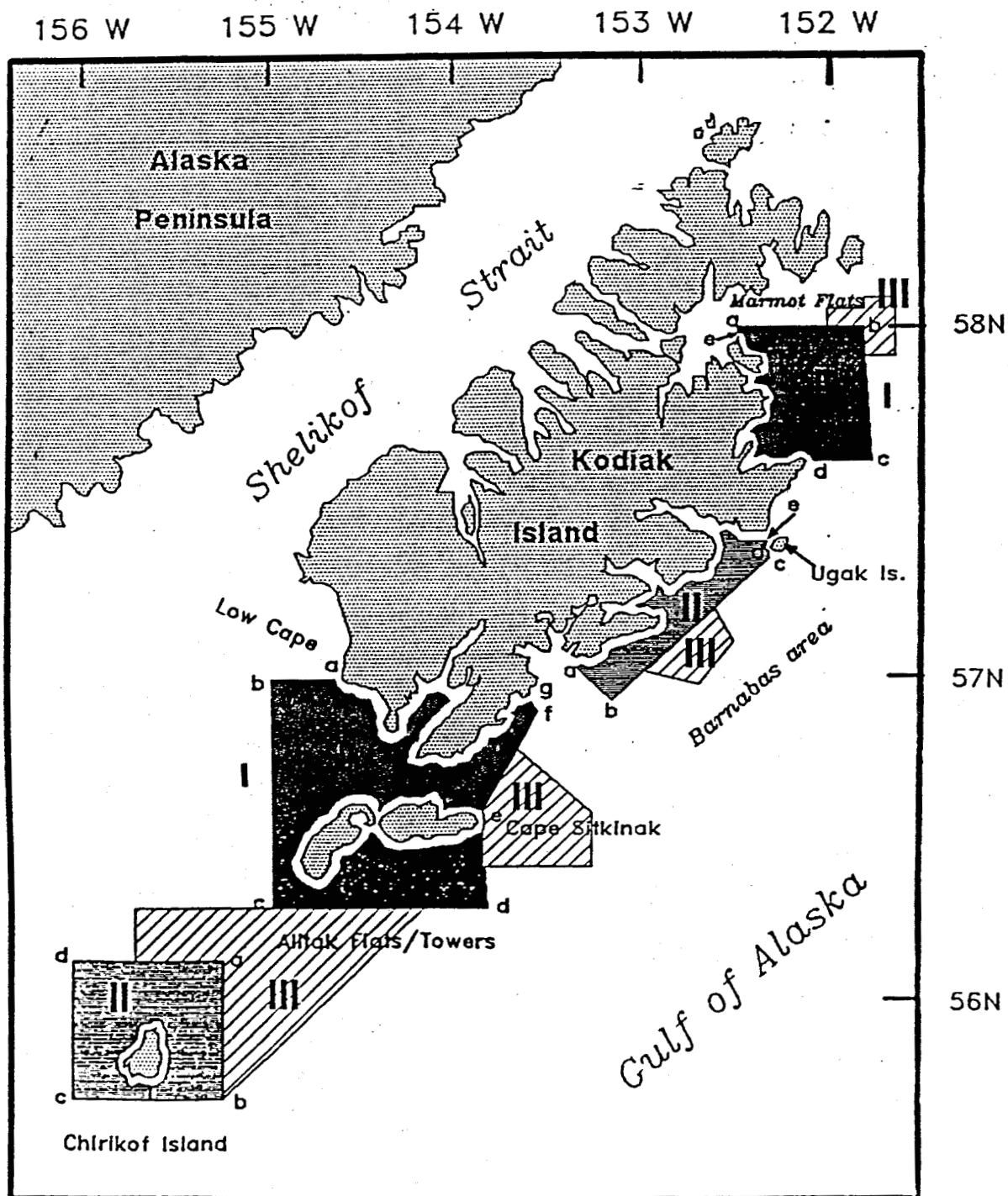


Figure 10. Areas around Kodiak Island closed to trawling except with pelagic trawls. TYPE I areas are closed year round. TYPE II areas are closed February 15 to June 15. TYPE III areas are pending. See section 672.24, Gear Limitations, for coordinate descriptions.

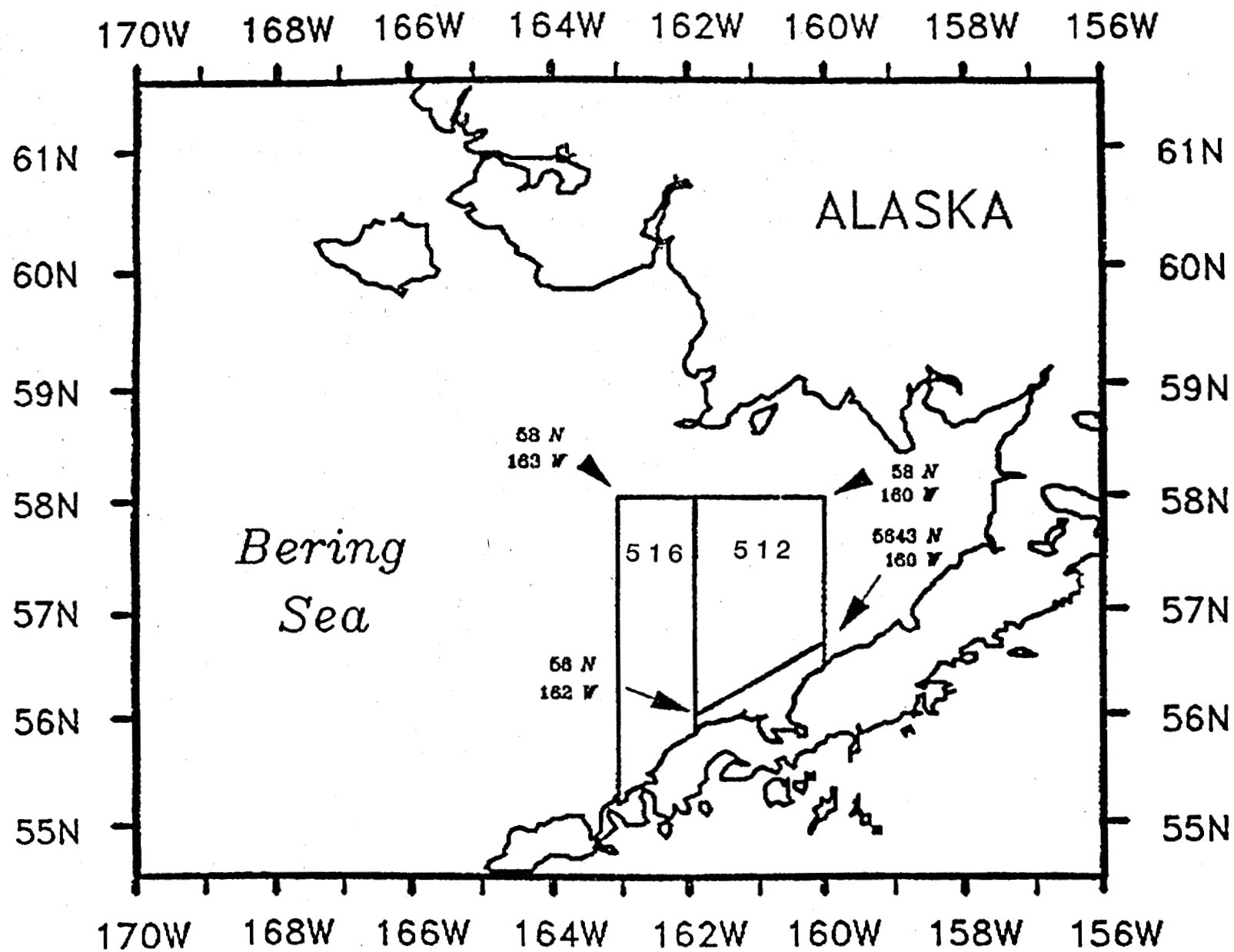


Figure 11. Area 512: No Trawl gear except Port Moller Program
Area 516: No Trawl gear March 15 to June 15

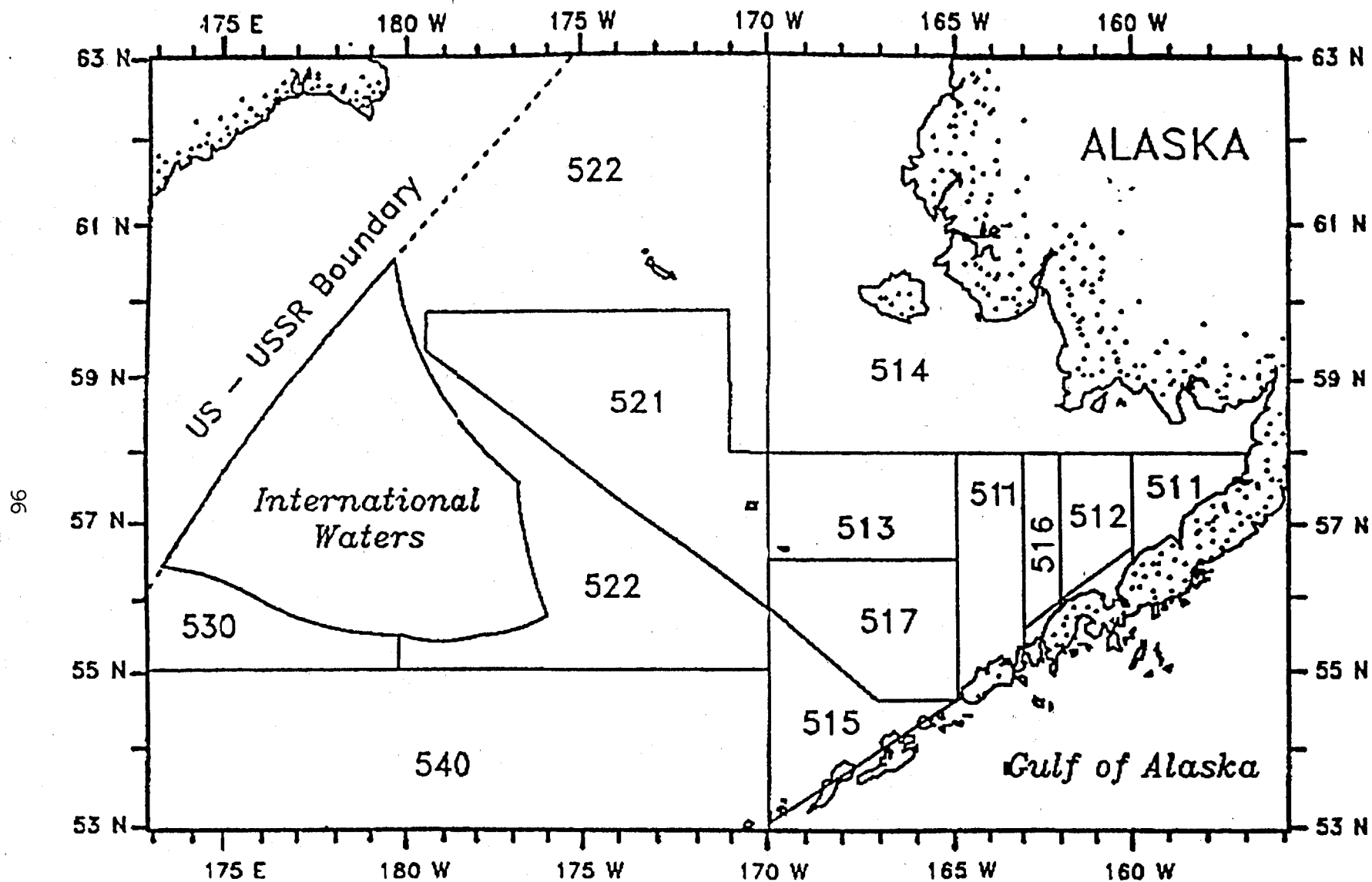


Figure 12 Statistical reporting areas in the BS/AI (Amendment 12A)

Bycatch protection zones: Zone 1 = 511 + 512 + 516
 Zone 2 = 513 + 517 + 521
 Zone 2H = 517

SEA URCHINS

HISTORIC BACKGROUND

The green urchin (*Strongylocentrotus droebachiensis*) was not harvested commercially in the Kodiak Area until 1980 when a small amount was taken to test marketability. There was little further interest in urchins until 1985 when a small harvest occurred. In 1986 the harvest increased with more divers participating.

Sea urchins are harvested for their roe content and seem to be prime for harvest in the Kodiak area between September and December. However, it appears some urchin beds have commercial quality roe as late as mid-February. All urchins are harvested by the use of scuba or hookah diving gear.

In interviewing buyers of the raw product, there appears to be a variation in the quality of the product. Taste, texture, and color of green urchin roe appears to vary with water depth, diet or freshwater influence. Urchin size has an effect on quality and marketability of sea urchin roe. Kodiak buyers were encouraging divers not to retain urchins less than 2" in diameter.

All of the urchins harvested in the Kodiak area were placed in shipping boxes live and air freighted to Japan via Anchorage. The roe was then extracted and prepared for market.

1989 FISHERY

A total of 47 divers registered to harvest urchins in the Kodiak area; however, landings were made by 28 divers. The urchin harvest for 1989 was 44,862 pounds with an average price of .80 cents per pound.

The Department did sample urchins from the commercial catch during 1989. Test diameter was measured with veneer calipers and recorded to the nearest millimeter (Figure 1).

Some urchins were sampled for percent of roe recovery. These urchins were weighed (whole weight) and cracked to expose the skeins of roe. The skeins were then removed from the urchin and weighed. Samples were taken during the months of October, November and December. The highest roe recovery was during November when the recovery was as low as 16%. These sample sizes were small and from specific sites around the Island and do not reflect the roe recovery around the entire Island of Kodiak.

STOCK STATUS

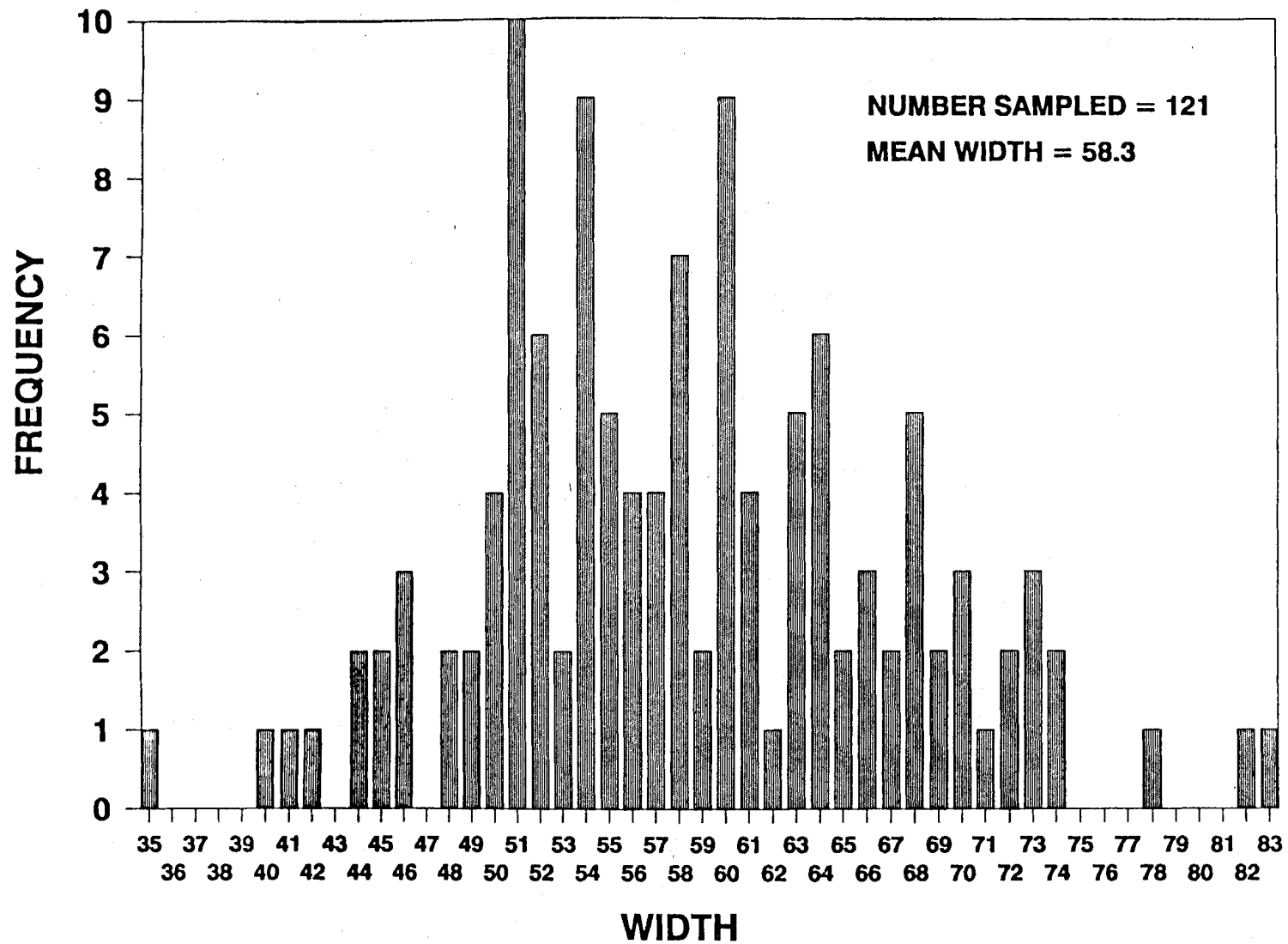
No assessment work is currently being done on sea urchins in the Kodiak area. Unutilized beds of urchins exist around Kodiak Island, and if a processing facility for urchins was available in Kodiak the Department would expect a dramatic increase in urchin harvest.

Table 1. Historic harvest of sea urchins in the Kodiak area.

Year	Permittee	Landings	Pounds Harvested (Live Weight)	Per/lb.
1980		Confidential		
1985		Confidential		
1986		Confidential		
1987	12	78	104,139	.69
1988	28	260	190,509	.80
1989	29	81	44,862	.82

FIGURE 1.

1989 KODIAK ISLAND SEA URCHIN SAMPLES



OCTOPUS

The giant Pacific octopus (*Octopus dofleini*) exists throughout Alaskan waters and is quite numerous in the Kodiak District. Most recorded catches have been incidental to other commercial fishing activities such as crabbing and bottomfishing (Table 1). The harvest had increased through the years to a peak of over 19,000 pounds in 1980. Reduced catches after 1980 may have been the result of shortened Tanner crab seasons. Interest in the fishery has been increasing due to the demand by longline fishermen for bait octopus.

STOCK STATUS

Although the octopus is numerous, no estimate of abundance is available. The Department currently has no directed study concerning octopus.

Table 1. Commercial catch, effort, and value for octopus in the Kodiak Management Area, 1977 - 1988.

Year	Number of Vessels	Number of Landings	Commercial Catch (Pounds)	Avg. Price Per Pound	Est. Value Ex-Vessel (dollar)
1977	5	9	1,000	.71	1,136
1978	11	21	3,336	.75	2,502
1979	20	43	6,978	.74	5,164
1980	27	61	19,342	.75	14,506
1981	21	46	5,872	.70	4,110
1982	12	29	3,854	.70	2,697
1983	12	20	3,764	.70	2,634
1984	17	43	6,487	.70	4,341
1985	10	12	4,812	.78	3,753
1986	5	8	643	.70	450
1987	8	15	14,151	1.08	15,300
1988	4	4	1,949	1.08	2,105
1989			Confidential		

RAZOR CLAMS

HISTORIC BACKGROUND

Razor clams, *Siliqua sp.*, have been harvested in the Kodiak Management Area since the early 1920's. Though many Kodiak Island beaches were explored with some success, the principal commercial harvest occurred in Kukak Bay, Hallo Bay, Big River and the Swikshak Beach Regions about 70 miles northwest of Kodiak. Digging continued somewhat on a regular basis until the early 1960's when a combination of increasing Federal and State regulations in processing the product, poor market conditions, and the earthquake of 1964 brought a decline. Commercial harvesting of clams for human consumption has never become re-established and the fishery has been strictly hand-digging for use as bait in the Dungeness crab fishery. In 1985, 1986, and 1987 there were no clam beaches in the Kodiak Area certified by the Alaska Department of Environmental Conservation as safe for human consumption. The certification program ended in July of 1980.

Many of the principal harvest areas along the Alaska Peninsula are adjacent to the Katmai National Monument. This includes all the land above mean high water from Cape Douglas to Cape Kubugakli. Commercial activity within the Monument is restricted. Current policy of U.S. Park Service dictates a ban on camping in the monument in support of a business enterprise.

In 1986 the Alaska Board of Fisheries adopted a regulation prohibiting hydraulic mechanical dredges from harvesting clams in the Kodiak Area east of Kilokak Rocks.

STOCK STATUS

The potential for a razor clam harvest in the Kodiak Management Area has been established by historic catch records and studies conducted by the Department. These studies, however, were conducted in the mid 70's and of little benefit in judging stock status at this time due to environmental changes which have occurred. Based on success by diggers the past few years, it appears the clam populations have drastically declined in the Swikshak - Big River Area, which historically produced a large portion of the razor clam harvest.

1989 FISHERY

During 1989 no landings of clams were made from the Kodiak area.

Table 1. Historic commercial razor clam catch effort and value for Kodiak Management Area, 1960 - 1989.

Year	Registered Diggers ¹	Lndgs.	Commercial Catch (Pounds)	Avg. Catch Per. Lndg. (Pounds)	Average Price Per Pound	Est. Price Ex-Vessel (Dollars)
1960	76		420,636		.105	44,000
1961	95		381,971		.105	40,000
1962	66		297,516		.105	31,000
1963	39		323,757		.11	35,600
1964	2		0		.00	-
1965	4		20,000		.25	5,000
1966	29		15,429		.38	6,000
1967	9		2,155		.40	900
1968	19		6,384		.40	2,600
1969	5	6	12,029	2,005	.40	4,812
1970	6	32	132,261	4,133	.40	53,000
1971	73	82	190,394	2,322	.30	57,000
1972	95	128	152,116	1,188	.35	53,000
1973	64	140	165,282	1,181	.40	66,000
1974	58	74	198,381	2,681	.50	99,000
1975	18	5	6,188	1,238	.50	3,000
1976	9	0	0	0	.00	-
1977	8	1	400	400	1.00	400
1978	-	1	1,352	1,352	.73	1,000
1979	-	0	0	0	.00	-
1980	-	8	8,006	1,001	.79	6,325
1981	-	5	8,186 ²	1,637	1.00	8,186
1982	-	11	11,608 ³	1,055	1.00	11,608
1983	-	7	7,920	1,131	1.00	7,920
1984	-	21	33,972	1,613	1.00	33,972
1985	-	11	16,945 ⁴	1,540	1.00	16,945
1986	-	4	3,993	998	1.00	3,993
1987	-	-	-	-	.00	-
1988	-	-	-	-	.00	-
1989	-	-	-	-	.00	-

¹Represents registered diggers not actual diggers - no data available after 1977 due to statewide issuance of Interim Use Permits.

²Additional 985 pounds of hardshell clams harvested.

³Additional 1,506 pounds of hardshell clams harvested.

⁴Additional 1,496 pounds of hardshell clams harvested.

ALASKA PENINSULA
SHELLFISH MANAGEMENT REPORT
TO
ALASKA BOARD OF FISHERIES

MARCH 1990

BY
JAMES A. SPALINGER - AREA MANAGEMENT BIOLOGIST
DAN O. DUNAWAY - ASSISTANT AREA MANAGEMENT BIOLOGIST

Kodiak Area Office
211 Mission Road
Kodiak, Alaska 99615
(907) 486-4791

ALASKA PENINSULA KING CRAB

INTRODUCTION

The red king crab fishery in the Alaska Peninsula Registration Area 'M' began in 1947, when 141,000 pounds were landed (Figure 1). The historic high catch of 22.6 million pounds occurred in 1966 (Table 1). Thirteen million pounds of that harvest came from the Unimak Bight District.

Of the three Area 'M' king crab districts, (Figure 1), the major portion of the harvest in the last decade has come from the Central District (Table 3), which was closed seven of ten years with Pavlof Bay being the major producer. The annual catch in the Unimak Bight District during the same period averaged less than half the Central District annual harvest. Catches in the Chignik District during this period have varied somewhat depending on effort but did not exceed 386,000 pounds (Table 4).

During the 1980/81 season the Area 'M' harvest reached just over five million pounds, the highest catch since the 1968/69 season (Table 1). The high catch was the result of strong recruitment from 1978 through 1980. Recruitment has declined severely since that time. The fishery remained closed for the first time during the 83/84 season.

1988/89 SEASON SUMMARY

As has been the case since 1983/84, the 1989/90 commercial fishery in Area 'M' was not opened. The Department anticipated a low population estimate in 1989 but was unable to complete the analysis before the scheduled September 25 opening date. In order to give industry sufficient notice, 1988 survey data was used to justify the closure. The closure was announced by Emergency Order 4-S-11-89 issued in Kodiak on August 15, 1989.

STOCK STATUS

This is the second year that the Department has used a trawl exclusively to access the crab populations in the South Peninsula.

The 1989 survey was conducted aboard the F/V *Royal Baron* from August 23 to October 19. One hundred sixty-seven (167) successful tows were completed in the Alaska Peninsula District to access both king and Tanner crab populations. This survey included a survey of the Chignik District which has not been surveyed for a number of years.

King crab were captured in Ikatan/Morchovoi, Cold, Volcano/Pavlof, Mitrofanina and Chignik Bays. Most of the king crab were caught in Ikatan/Mozhovi with a total of four tows that yielded a total of 423 king crabs.

Using the "area swept" method, the total population was estimated to be 400,618 king crabs; 209,505 males and 191,113 females. It was estimated that only 15,460 legal males populate the area. Populations estimates of all groups of crab had increased over last season with the exception of legal male crab which was down 70% of last year's estimate. The king crab population remains well below the level to warrant a commercial fishery.

Complete survey results will be available in the 1990 Alaska Department of Fish and Game's crab survey results report.

BROWN KING CRAB

Occasionally fishermen express an interest in exploring Area 'M' for commercial quantities of brown king crab (*Lithodes aequispina*). In 1983 five vessels were registered but no catch was recorded.

Presently, male brown king crab six inches or greater in shell width may be taken from January 1 through December 31 under the conditions of a permit issued by the Commissioner.

1989 SEASON

No vessels were registered to fish for brown king crab in Area 'M' during 1989.

STOCK STATUS

Stock status is unknown at this time. However, no commercial quantities have been found to date.

Table 1. Catch and effort statistics for king crab in Area 'M'.

Year	Vssls.	No. of Lnds.	No. Crab ¹	No. Pounds ¹	Pots Lifted	CPUE	Avg. Wt.	Price Per Lb.
1947			18,800	141,000			7.5	
1948			518,500	3,363,000			6.5	
1949			205,500	3,476,000			12.0	
1950			270,000	2,124,000			7.9	
1951			86,500	599,000			6.9	
1952			32,400	298,000			7.6	
1953			38,400	380,000			10.0	
1954			31,666	316,660			10.0	
1955			164,069	1,640,688			10.0	
1956			421,651	4,221,496			10.0	
1957			668,709	6,687,092			10.0	
1958			724,595	7,245,947			10.0	
1959			568,303	6,166,974			10.9	
1960		1,496	677,100	6,700,000			9.9	
1961		959	419,354	3,900,000			9.3	
1962		657	287,624	2,273,013			7.9	
1963	27	1,037	970,739	6,539,129			6.7	.09
1964	40	1,297	1,906,018	14,354,060			7.5	.10
1965	36	1,081	1,813,728	14,713,501			8.1	.10
1966	37	1,255	2,494,949	22,577,587			9.0	.10
1967	39	1,062	1,943,463	17,252,307			8.9	.19
1968/69	34	885	1,273,567	10,944,472			8.6	.34
1969/70	33	415	558,800	4,137,000	51,300	11	7.7	.25
1970/71	25	339	446,042	3,425,760	38,995	11	7.7	.25
1971/72	26	364	597,394	4,123,130	41,759	14	6.9	.28
1972/73	29	301	610,300	4,069,362	34,408	18	6.7	.NA
1973/74	36	389	658,632	4,260,674	53,642	12	6.9	.72
1974/75	36	318	644,054	4,572,101	44,951	14	7.1	.43
1975/76	37	248	367,221	2,605,310	35,104	11	7.2	.41
1976/77	26	122	125,778	958,069*	17,748	7	7.7	.61
1977/78	15	73	119,641	726,382	10,551	11	6.1	1.00
1978/79	33	226	520,168	3,093,859	31,142	17	5.9	1.27
1979/80	68	288	738,859	4,453,557	41,753	18	6.0	.92
1980/81	51	358	821,071	5,080,632*	54,114	15	6.2	.96
1981/82	56	341	515,882	3,168,689	51,776	10	6.1	1.40
1982/83	63	157	271,237	1,683,654	30,894	9	6.2	3.20
1983/84			N O	F I S H E R Y				
1984/85			N O	F I S H E R Y				
1985/86			N O	F I S H E R Y				
1986/87			N O	F I S H E R Y				
1987/88			N O	F I S H E R Y				
1988/89			N O	F I S H E R Y				
1989/90			N O	F I S H E R Y				

* Combined 6-1/2 inch and 7-1/2 inch seasons.

Table 2. Comparison of 6 1/2 inch season king crab data in the Unimak Bight District.

Year	Lndgs.	No. Crab	No. Pounds	Pots Lifted	Avg. Wt.	CPUE	Avg. Percent Recruits	Length (mm)
1971/72	54	175,154	1,310,886	9,226	7.5	19	16	163.2
1872/73	22	97,825	741,881	3,726	7.6	26	13	163.6
1973/74	34	166,103	1,280,397	8,618	7.7	19	17	162.3
1974/75	40	186,028	1,538,554	9,906	8.3	19	13	168.4
1975/76	29	97,493	757,955	7,028	7.8	14	19	166.5
1976/77	4	7,216	55,286	700	7.7	10	11	167.1
1977/78		Harvest Confidential					N O	D A T A
1978/79	8	31,169	198,660	4,026	6.4	8	63	149.6
1979/80	50	274,336	1,699,954	12,242	6.2	22	57	151.3
1980/81	37	304,949	1,849,636	10,141	6.1	30	52	153.0
1981/82	22	90,338	571,905	6,615	6.3	14	32	156.0
1982/83	4	2,767	18,017	1,172	6.5	2	N O	D A T A
1983/84			N O	F I S H E R Y				
1984/85			N O	F I S H E R Y				
1985/86			N O	F I S H E R Y				
1986/87			N O	F I S H E R Y				
1987/88			N O	F I S H E R Y				
1988/89			N O	F I S H E R Y				
1989/90			N O	F I S H E R Y				

Table 3. Comparison of 6 1/2 inch season king crab data in the Central District.

Year	Lndgs.	No. Crab	Pots No. Pounds	Avg. Lifted	Avg. Percent Wt. CPUE	Length Recruits	(mm)
1971/72	310	422,240	2,812,244	32,533	6.7 13	41	154.0
1972/73	271	494,610	3,194,229	29,170	6.5 17	57	150.6
1973/74	319	447,535	2,882,437	36,937	6.4 12	54	149.3
1974/75	263	445,412	2,935,707	33,057	6.6 14	57	151.9
1975/76	205	251,440	1,715,545	26,657	6.8 9	48	156.0
1976/77	82	80,088	557,790	9,613	7.2 8	40	155.2
1977/78	48	90,670	512,448	6,588	5.7 14	69	145.5
1978/79	201	471,825	2,757,088	25,432	5.8 19	79	147.2
1979/80	209	447,227	2,604,300	27,328	5.8 16	70	147.5
1980/81	225	449,597	2,692,815	32,014	6.0 14	67	149.8
1981/82	174	392,889	2,329,170	27,679	5.9 14	66	148.0
1982/83	143	261,387	1,609,681	27,142	6.2 10	66	149.5
1983/84			N O	F I S H E R Y			
1984/85			N O	F I S H E R Y			
1985/86			N O	F I S H E R Y			
1986/87			N O	F I S H E R Y			
1987/88			N O	F I S H E R Y			
1988/89			N O	F I S H E R Y			
1989/90			N O	F I S H E R Y			

Table 4. Comparison of 6 1/2 inch season king crab data in the Chignik District.

Year	Lndgs.	No. Crab	No. Pounds	Pots Lifted	Avg. Wt.	CPUE	Percent Recruits	Avg. Length (mm)
1972/73	9	17,865	133,252	1,512	7.5	12	23	NA
1973/74	37	44,994	385,305	8,087	8.6	6	41	169.2
1974/75	15	12,614	97,840	1,988	7.8	7	36	162.0
1975/76	13	18,288	131,810	1,419	7.2	13	5	160.4
1976/77	6	9,859	76,406	673	7.8	15	26	167.1
1977/78	22	27,103	200,692	3,143	7.4	9	33	159.6
1978/79	17	17,174	138,111	1,684	8.0	10	23	160.9
1979/80	29	20,472	168,368	2,183	8.2	9	29	161.5
1980/81	36	24,314	194,095	3,403	8.0	7	15*	167.8
1981/82	Harvest Confidential						NO	DATA
1982/83	11	7,083	55,580	2,580	7.9	3	32	156.1
1983/84			NO	FISHERY				
1984/85			NO	FISHERY				
1985/86			NO	FISHERY				
1986/87			NO	FISHERY				
1987/88			NO	FISHERY				
1988/89			NO	FISHERY				
1989/90			NO	FISHERY				

* Based on only one sample.

Table 5. Comparative male king crab catch data, Alaska Peninsula abundance survey.

Year	Stations Fished	Pots Lifted	Legals		Sublegals	
			Number	CPUE	Number	CPUE
1975	110	610	815	1.4	4,776	7.8
1976	129	801	874	1.1	8,006	10.0
1977	75	354	3,610	10.2	16,986	48.0
1978	62	355	7,259	20.4	10,960	30.9
1979	69	330	4,411	13.4	7,141	21.6
1980	120	700	8,110	11.6	7,263	10.4
1981	127	750	4,545	6.1	2,538	3.4
1982	113	630	1,197	1.9	805	1.3
1983	77	307	317	1.0	216	.7
1984	218	498	324	.65	25	.05
1985	138	410	36	.09	18	.04
1986	129	400	65	.16	52	.13
1987	145	434	11	.03	17	.04
1988 ¹	106		45		27	
1989	167		19		215	

¹ Trawl survey introduced in 1988. Catches and population estimates not directly comparable to pot survey results.

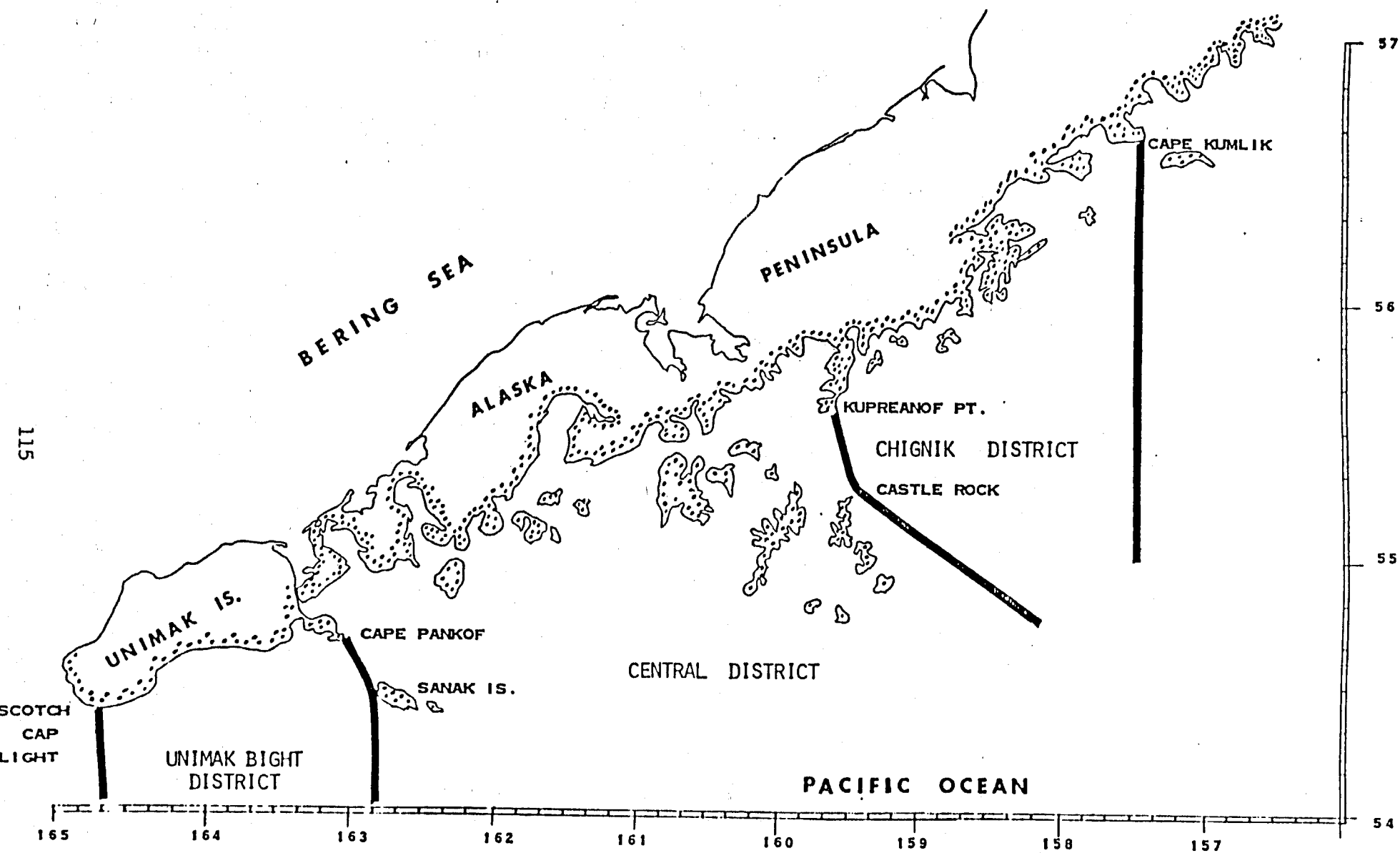


Figure 1. Alaska Peninsula Area "M".

CHIGNIK TANNER CRAB

INTRODUCTION

The Chignik District of Area 'J' consists of the waters south of the Alaska Peninsula from Cape Kumlik west to Kupreanof Point (Figure 1).

The Chignik Tanner crab fishery began in 1968 when 21,000 pounds of crab were caught (Table 1). During the next four years, the market was uncertain and harvests were erratic. Other than a 14 day closure before each king crab season, and limiting gear to pots or ring nets, few regulations governed the early fishery.

In 1973, market conditions improved and 15 vessels produced nearly 750,000 pounds (Table 1). There were 25 vessels the next year and the catch grew to 4 million pounds. In 1975/76, 35 vessels landed the peak harvest of 11.2 million pounds (Table 1). By 1975 and 1976, the rapid growth of the fishery caused the Board of Fisheries to adopt several protective regulations. A system to register and inspect vessels was adopted. The harvest was restricted to male crab with carapace widths equal to or greater than 5.5 inches. The seasons were set to open November 1 and to close in May or June, to protect the mating and molting period of the crab. In addition, guideline harvest levels were established. Finally, concern over lost pots led to the adoption of a regulation requiring that: "After July 1, 1978, each Tanner crab pot shall contain a mechanism that will destroy its fish catching and holding ability if lost or abandoned." For the next five seasons, the harvest was less variable and catches ranged between 2.5 and 5.6 million pounds (Table 1).

Three other points characterized the first 14 years of the Chignik District fishery. First, the productive grounds included nearly all waters of the District. The offshore waters between Mitrofanina Island, Lighthouse Rocks, and the Semidi Islands were the most

productive of all. Second, most of the fishing activity began in late March after closures had been made in the Kodiak and South Peninsula District fisheries. Third, no abundance surveys were conducted during this period. The 5-10 million pound guideline may have been based upon the harvests of 1974 to 1976/77. Even with the relatively liberal seasons of the time, the guideline was rarely attained.

Since 1981, there have been several changes in the fishery. The Department conducted trawl surveys each summer from 1981 to 1984. The surveys predicted that there would be poor recruitment after the 1983 fishing season. Harvest projections were drastically reduced for the 1984 and 1985 fisheries. No funds have been available for the Chignik District surveys since 1984, and harvest projections have depended upon the performance of the previous year's fishery.

As predicted, the commercial harvests dropped sharply each season from 1984 to 1986 (Table 1). After an insignificant increase in 1987, the 1988 catch declined to 183,000 pounds; the lowest harvest in 16 years (Table 1). The catch did not decline uniformly over the grounds, but fell off first and most rapidly, in the popular offshore waters. The productive grounds shrank steadily until only Chignik Bay and a few other near shore areas produced crab in 1988.

The dwindling catches, along with attempts to make the District a superexclusive registration area, caused a reduction in the size of the fleet. In 1983, 48 vessels, including several large, Bering Sea type vessels, participated in the fishery. By 1988 the fleet consisted of four locally owned seine vessels, one boat from Sand Point, and one sixty-five foot vessel from Kodiak. Beginning with the 1981 season, the fleet has commenced fishing on the opening date of the season and continued fishing until the District was closed. The altered nature of the fishery prompted several changes to the opening date of the fishery: first to December 15, in 1981/82; then to February 10, for the 1983 and 1984 seasons. In

part, the new dates were established to harvest the crab at peak quality. Further, some fishermen hoped the new dates would find the large vessels busy fishing in the Bering Sea thus reducing competition in the Chignik and South Peninsula Districts. However, in the adjoining South Peninsula District, seasons opening in February were found to extend into the molting period of the crab. Therefore, beginning in 1985, the opening date has been January 15. In 1988, the Board of Fisheries adopted a March 31 closure date because the molting period may begin before the former May 15 closure.

1989 FISHERY

No survey was conducted in the Chignik District in 1988 and no preseason harvest projection was announced for the 1989 fishery.

Registrations and tank inspections for the 1989 Chignik Tanner crab fishery began at noon January 14. Only three locally owned seiner sized vessels were initially registered for the fishery.

The fishery opened at noon January 15. Several deliveries were made during the following two weeks with the catch rates averaging 27 to 31 crabs per pot. The fishing was better than in 1988, but the numerous landings are misleading. One vessel had no live tank and often made two small deliveries per day.

Shortly after the closure of the South Peninsula District, two more vessels joined the fleet. The catch rates varied between 15 and 22 crabs per pot for the next six weeks. Severe storms plagued much of the season, the catch rates were erratic, and the fishermen had to make short trips on the rare days between storms. Poor weather and low catch rates caused two skippers to quit the fishery by the middle of February.

With only four vessels remaining in the fishery and with the relatively stable catch rates, the Department allowed the fishery to continue to the regulatory closure date of March 31, 1989.

In summary, 6 vessels made 34 deliveries for a total catch of 323,120 pounds. Since 1985 no harvest has been as big (Table 1). Most of the crab came from the Chignik Bay and Kujulik Bay (Table 3). The catch rate of 15 crabs per pot was slightly higher than catch rates of the previous four seasons (Table 1).

For the first time in several years, crab were processed in Chignik. For a short time, Larry Boyle was stationed in Chignik to sample the crab deliveries. The crab averaged 147.3 mm in carapace width and 2.3 pounds each (Tables 1-3, Figure 2). Ninety-five percent of the catch were recruit crab (Figure 2).

Depending upon the delivery location, the fishermen received between \$2.70 and \$3.05 per pound for their crab (Table 1). Chignik crab were delivered in Sand Point, Chignik, and Kodiak. The total ex-vessel value of the catch was \$984,512.

STOCK STATUS

As mentioned previously, no survey has been conducted in the Chignik District since 1984. The stocks may be increasing slightly: the harvest increased, the catch rates improved slightly, and the number of recruits is high. In addition, fishermen continue to report that they see many sublegal sized crabs while they are fishing. The reports are encouraging, but they are limited to very few bays. Compared to historic population levels, the Chignik district Tanner crab population remains severely depressed.

The Department anticipates conducting a trawl survey program in the District in 1989 if funds are available.

NOTES

The Department wishes to thank VPSO Ron Bowers of Chignik for his assistance with tank inspections in Chignik. His help has been a great service to both the Department and to the fishermen.

The Department extends its thanks to the staff of Aleutian Dragon Fisheries for their assistance and for their hospitality to sampler Larry Boyle.

Table 1. Chignik District Tanner crab catch and effort statistics.

Year	Vssls.	Lndgs.	No. Crab ¹	No. Pounds ¹	Pots Lifted	Avg. Wt.	CPUE	Price/ Pound ²	% Recruits ³
1968	-	-	-	21,100	-	-	-	-	-
1969	-	-	-	38,100	-	-	-	-	-
1970	-	-	-	2,800	-	-	-	-	-
1971	-	-	-	152,300	-	-	-	-	-
1972		Harvest Confidential							
1973	15	56	297,363	747,788	8,080	2.5	51	.16	-
1974	25	115	1,586,560	4,054,873	28,083	2.6	57	.20	-
1974-75	25	91	1,438,508	3,649,444	22,675	2.5	63	.14	-
1975-76	35	288	2,724,509	6,926,161	52,381	2.5	52	.185	-
1976-77	21	141	2,098,226	5,672,919	40,604	2.7	52	.33	-
1977-78	32	140	1,725,042	4,693,830	38,414	2.8	45	.42	-
1978-79	39	126	926,253	2,536,105	28,378	2.7	33	.55	-
1979-80	42	155	2,340,004	3,517,920	54,627	2.6	25	.54	-
1980-81	24	112	1,534,847	3,653,723	44,022	2.4	35	.64	65.6
1981-82	45	174	1,343,500	3,240,576	47,830	2.4	28	1.21	64.7
1983	48	136	1,432,029	3,497,370	60,210	2.4	24	1.12	65.1
1984	17	41	269,742	659,043	14,665	2.4	18	1.09	33.5
1985	15	27	162,448	375,476	15,708	2.3	10	1.42	51.2
1986	6	12	85,697	188,162	7,435	2.2	12	1.97	85.3
1987	10	20	89,329	195,060	7,052	2.2	13	2.28	90.1
1988	6	11	87,148	183,111	6,544	2.1	13	2.33	91.3
1989	6	34	142,470	323,120	9,845	2.3	15	3.05	95.0

¹ Includes deadloss

² Computed only for live poundage where price information was available

³ Recruits = newshell male crab from 137 to 163 mm carapace width

Table 2. Tanner crab catch, landings, vessel effort, catch per pot (CPUE), and catch per month by statistical subarea, Chignik District, 1988/89. Average catch per pot unstandardized for soak period and gear type.

STAT AREA	BOATS	LNDGS.	POUNDS HARVESTED	AVG. WT.	CPUE	-CATCH IN POUNDS BY MONTH-			
						JANUARY	FEBRUARY	MARCH	APRIL
585601	4	30	190,254	2.2	17	42,700	83,442	64,112	
*****	4	10	132,866	2.3	12		18,970	90,771	23,125
GR.TOTAL	6	34	323,120	2.3	14	42,700	102,412	154,883	23,125

"*" STAT AREA TOTALS HAVE BEEN COMBINED TO PROTECT VESSEL CONFIDENTIALITY.

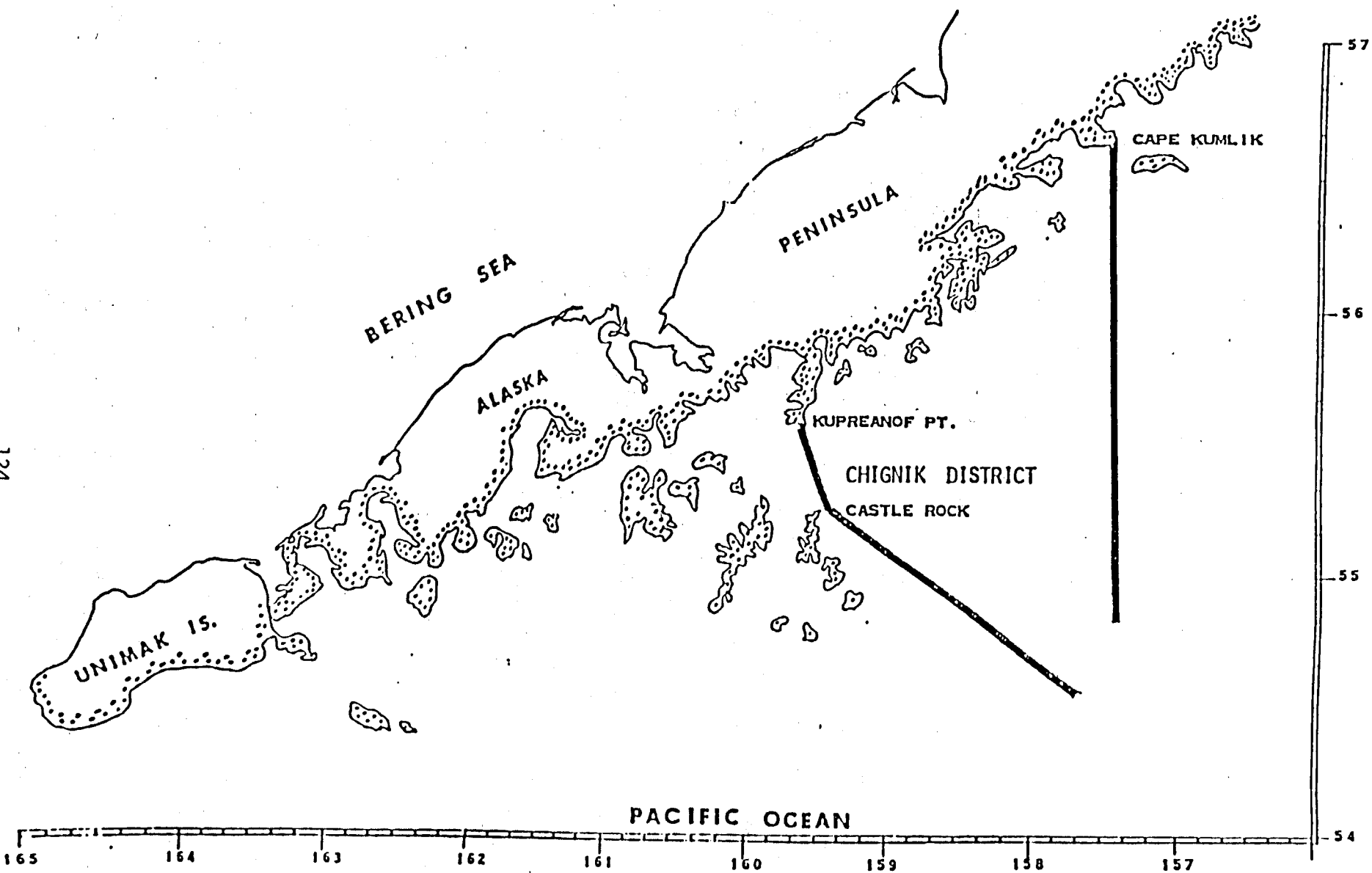


Figure 1. Chignik Tanner crab district.

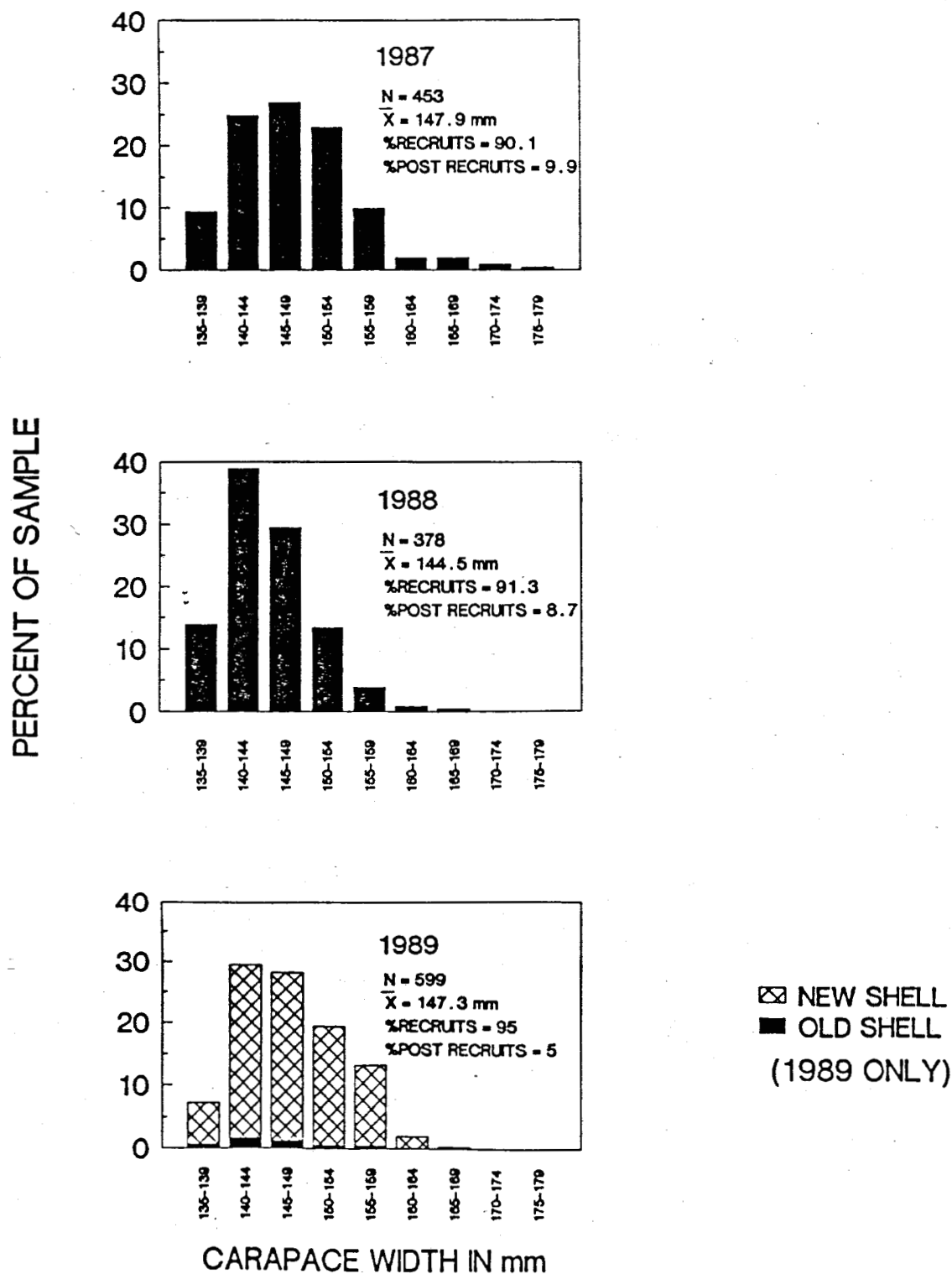


Figure 2. Tanner crab width frequencies from the commercial fishery, Chignik District, 1987-1989.

SOUTH PENINSULA TANNER CRAB

INTRODUCTION

The South Peninsula District of Area J includes all waters south of the Alaska Peninsula from Kupreanof Point to Scotch Cap Light on Unimak Island (Figure 1). The first harvest of Tanner crab from the Area occurred in 1967 when 3,100 pounds were landed. The fishery grew quickly, and by 1973 harvests exceeded five million pounds (Table 1). In 1974 guideline harvest levels were established, and in 1975 seasons were imposed to protect the mating and molting period of the crab. In 1976, the minimum size limit of 5½ inches across the carapace was established. During the six seasons from 1974 through 1978/79 harvests ranged from five to eight million pounds (Table 1). The fishery peaked in 1978/79 when 8.6 million pounds of crab were caught (Table 1). From 1979/80 to 1984 the harvest and CPUE declined in response to low recruitment into the population (Table 1). The population reached a low level in 1984 and the fleet only produced 1.8 million pounds (Table 1). Recruitment improved in the years 1985 through 1988 and harvests have ranged from two to nearly four million pounds.

1989 FISHERY

The 1988 summer survey found the abundance of legal sized Tanner crab to be very low. The department announced a preseason harvest projection of 700,000 pounds; the lowest projection ever made for the District. Since this was the first season the trawl survey method was used, it was announced that inseason fishery data would be considered as usual before any closure decisions were made. (See the Stock Status section of this report.)

Two seasonal dockside samplers assisted with the registrations, inspections, and monitoring of the fishery. Larry Boyle, a Fishery Biologist I, worked in Sand Point and Paul Kuriscak, a Fishery

collect valuable data as the crab were delivered to the onshore processing plants.

Two floating processors registered to work in the District. Each carried a privately contracted observer as required by the new mandatory observer regulation. The observers gathered useful data that would not have been collected otherwise. With observers onboard the floaters and samplers at the shore-based plants, all delivery points were monitored equally.

Registrations and tank inspections for the 1989 South Peninsula Tanner crab fishery began at noon January 14. In spite of the very low harvest projection, 66 vessels were registered for the fishery. All 65 vessels actually used in the fishery were catcher boats. Fewer of the large, Bering Sea style, crab vessels were used in the 1989 fishery than were used in the 1988 season (Table 2). The average vessel length in 1989 was 55 feet compared to the average of 60.5 feet in 1988 (Table 2). Only 9,251 pots (142 pots per boat) were reported in 1989 compared to the 11,688 pots (160 pots per boat) reported in 1988 (Table 2). The smaller average vessel size may be the main reason for the reduced number of pots used in 1989. In addition, the reduced harvest projection may have caused some skippers to use less gear. The total hold capacity of the fleet was approximately 3 million pounds; 2.3 million pounds above the projected harvest.

To prevent an excessive harvest by the large fleet, the Department did not wait to collect data from vessels delivering to the processors. Instead, the on-grounds activities were monitored through reports from 38 skippers (58 percent of the fleet). The captains were asked to make daily radio reports on the number of crab they had caught, the number of pots they had pulled, and their fishing location. Codes for transmitting the information were

given to the skippers at the time of their tank inspections. The vessels used by the skippers reporting were representative of all but the smallest vessels in the fleet.

The season opened at noon January 15, 1989. For the next 36 hours the fishermen were busy setting out their pots.

The first catch reports were received on the morning of January 17. Some fishermen didn't have all their pots set and didn't have any crab. Other fishermen had pulled more than 150 pots. Consequently, catch rates varied widely from zero to over 60 crab per pot. Twenty-five skippers' reports averaged catch rates of nearly 29 crab per pot.

On the morning of January 18, another 25 catch reports were received. The reports indicated that the weather was cold and rough, but fishable. Four skippers reported that they were hampered by equipment break-downs. The processors reported only a few small deliveries. The catch rates ranged from 5 crabs per pot to 45 crabs per pot, and the overall catch rate declined slightly to 25 crabs per pot. Nearly 500,000 pounds were estimated to be aboard the fleet.

Although the catch was approaching the preseason harvest projection, no closure was announced. The strong catch rates and the high quality of the fishermen's reports gave the Department confidence to wait. Also, it appeared that the harvest projection could be exceeded slightly without harming the crab stocks. One more day of fishery data was expected to provide a stronger basis for any management decisions. In addition, gale winds and severe icing conditions, forecast by the National Weather Service, were expected to slow the harvest.

By January 19, the total harvest was estimated to be 700,000 pounds and the catch rates had declined significantly. Twenty-four fishermen reported catch rates that averaged only 10 crabs per pot.

The fishing was so poor in Cold Bay that one skipper had already stored his gear. In Pavlof Bay the fishermen were moving their pots to find better grounds. The catch rates in Ikatan and Morzhovoi Bays were declining as well. Furthermore, many fishermen reported that they were handling large numbers of female Tanner crab.

The Department issued Emergency Order 4-S-01-89 to close the South Peninsula District Tanner crab season at 12:00 noon, Sunday, January 22, 1989. The closure date was chosen to allow the fishermen time clean out their gear yet work around a storm that was forecast to strike on January 20.

The powerful storm struck on January 21, forcing skippers to leave many baited pots on the grounds. Several boats were pinned in Volcano Bay for nearly a week as they waited for the weather to break. The bad weather lingered so long that it was nearly a month before all of the pots could be removed from the grounds.

To summarize the seven day fishery: 65 vessels made 87 deliveries amounting to 1,055,082 pounds of crab. As predicted, the harvest was the lowest since 1969 when the fishery was in its developmental stages (Table 1). The 1989 catch rate of 16 crab per pot was well below the catch rates of 23 to 26 crab per pot common since the 1985 season (Tables 1 & 3). The crab averaged 2.4 pounds each and 150.8 mm in carapace width (Tables 1 & 3, Figure 2). Recruits comprised nearly 53 percent of the catch; much less than the 79 percent of the 1988 fishery (Table 1). Pavlof Bay and nearby waters produced over 58 percent of the total catch; the Ikatan/Morzhovoi area produced nearly 27 percent; and the Cold Bay/Belkofski area produced 10 percent.

The fishermen received \$2.70 to \$2.75 per pound for crabs sold locally or in Dutch Harbor. The total ex-vessel value of the fishery was estimated to be 2.8 million dollars.

The crew of the Fish and Wildlife Protection vessel, *P/V Trooper*, provided enforcement throughout the season. The *P/V Trooper's* crew patrolled the grounds, observed some deliveries and occasionally checked on the remote observers and samplers. In addition, they provided useful observations from the grounds. Undersized crab cases, and illegal gear storage cases were made by the officers. At the end of the season, the officers were reasonable when the storm made it impossible to comply with some gear regulations. The presence of the *P/V Trooper* and its crew helped to promote an orderly fishery.

The fishermen deserve much of the credit for the success of the 1989 season. Their daily reports provided information that was crucial to the management of the fishery. Eleven fishermen reported every day, while others missed a report or two. Only two skippers who volunteered to report neglected to make any sort of report.

STOCK STATUS

In 1988 the Department switched to a trawl survey in the South Peninsula District. Trawl surveys have several advantages over the previously used pot surveys. Unlike the pot survey, the trawl survey produces an independent estimate of actual crab abundance. The independent survey results provide more accurate estimates of recruitment and exploitation. More importantly, trawl gear captures a more realistic cross-section of the entire crab population. Abundance estimates of sublegal crab stocks may be generated from trawl survey data which may then be used in harvest projections or other management decisions. Finally, trawl surveys are more economical. Trawls allow more ocean bottom to be surveyed for less money, in less time, and with a smaller crew, than is possible when using pots.

Experimental trawls were made in Pavlof Bay in 1983 and 1984, but 1988 was the first time a trawl survey was used for the entire

South Peninsula district. The 1988 survey included Ikatan, Morzhovoi, Cold, Belkofski, Volcano, Pavlof, Beaver and Balboa Bays. The waters around Sanak Island, Stepovak Bay, Unimak Bight, and the Chignik District were not surveyed.

The 1988 survey was conducted aboard the R/V *Resolution* from August 5 to August 18. One hundred six (106) tows were made. Eighty-nine of the tows produced catches of Tanner crab. A total of 6,095 crab, 3,634 males and 2,461 females were caught. Legal males constituted less than 16 percent of all males caught; 332 crab or nearly 58 percent of those legal were recruits.

For the area surveyed, the entire Tanner crab population was estimated to be 7.26 million animals; 4.3 million males,, and 3 million females. Catches from the Pavlo/Volcano Bay area accounted for 45 percent of the overall population estimate with Ikatan/Morzhovoi contributing 27 percent and Cold Bay/Belkofski, 21 percent. The prerecruit one and prerecruit two age classes were estimated at nearly one million animals each, while the estimated 700,000 legal sized crab made up only nine percent of the overall population estimate.

Table 1. Tanner crab catch and effort statistics for South Peninsula District.

Year	Vssls.	No of Lnds.	No. Crab ¹	No. Pounds ¹	Pots Lifted	Avg. Wt.	CPUE	Price/ Pound ²	% Recruits
1967	-	-	-	3,100	-	-	-	-	-
1968	-	155	36,835	110,610	-	3.0	-	-	-
1969	-	173	221,946	606,178	-	2.7	-	-	-
1970	-	-	-	2,093,600	-	-	-	-	-
1971	17	242	813,610	2,140,585	-	2.6	-	.10	-
1972	-	-	-	3,618,900	-	-	-	-	-
1973	36	390	2,213,006	5,615,563	53,573	2.5	41	-	-
1974	44	386	3,504,668	8,300,578	58,444	2.4	60	-	-
1974/75	44	131	2,053,530	5,195,800	38,153	2.5	54	.14	-
1975/76	36	288	2,724,509	6,926,161	52,381	2.5	52	.20	-
1976/77	28	389	2,524,565	6,773,838	63,143	2.7	40	.32	-
1977/78	36	374	2,847,948	7,446,270	70,587	2.6	40	.40	-
1978/79	48	332	3,267,122	8,684,408	82,374	2.7	40	.51	65.8
1979/80	61	363	2,581,544	3,961,251	96,989	2.7	27	.54	39.5
1980/81	43	268	1,274,539	3,294,106	59,560	2.6	21	.58	34.7
1981/82	72	365	1,815,060	4,589,042	81,008	2.5	22	1.05	50.2

-Continued-

Table 1. Tanner crab catch and effort statistics for South Peninsula District (continued).

Year	Vssls.	No of Lnds.	No. Crab ¹	No. Pounds ¹	Pots Lifted	CPUE	Avg. Wt.	Price/ Pound ²	% Recruits
1983	82	230	1,144,096	2,863,798	70,524	16	2.5	1.20	55.4
1984	61	207	775,472	1,789,883	50,726	15	2.3	1.04	29.6
1985	52	184	1,097,182	2,549,686	47,465	23	2.3	1.42	73.0
1986	74	187	1,589,759	3,781,950	65,078	24	2.4	1.72	72.9
1987	54	106	950,300	2,400,784	37,511	25	2.5	2.03	56.1
1988	73	148	1,359,371	3,328,809	52,516	26	2.5	2.20	78.6
1989	65 ³	87	433,112	1,055,082	27,958	16	2.4	2.70	52.9

¹ Includes Deadloss

² Computed for live crab only

³ One additional vessel was registered but did not fish in the District

Table 2. Historic vessel size and pot use, South Peninsula District Tanner crab fishery.

Season	Total	-----Length-----		Total	-----Pots-----	
		Average	Min-Max		Avg/Vssl	Min-Max
1989	65	55	37-105	9,251	142	30-290
1988	73	60.5	37-180	11,688	160	70-500
1987	54	56.8	40-106	8,100	150	51-500
1986	75	67.4	40-150	10,804	144	50-325
1985	52	55.7	40-150	6,573	126	62-275
1984	61	56.2	38-150	8,275	135	57-300
1983	82	63.9	38-150	10,713	133	20-400
1981/82	72	69	38-135	11,992	166	52-400
1980/81	43	63.7	38-122	6,579	154	40-400
1979/80	62	69	41-146.5	NA	NA	NA
1978/79	53	69.4	36-132	6,890	130	30-300

Table 3.

Tanner crab catch, landings, vessel effort, catch per pot (CPUE), and catch per month by statistical subarea, Peninsula District, 1988/89. Average catch per pot unstandardized for soak period and gear type.

STAT AREA	BOATS	LNDGS.	POUNDS HARVESTED	AVG. WT.	CPUE	-CATCH IN POUNDS- JANUARY
605504	4	5	14,407	2.3	14	14,407
615508	33	42	604,426	2.5	16	604,426
625437	6	6	41,404	2.4	15	41,404
625501	6	9	28,876	2.2	13	28,876
625502	10	16	60,012	2.3	10	60,012
635432	9	9	164,815	2.3	19	164,815
635502	4	4	39,492	2.4	14	39,492
*****	15	17	101,650	2.4	15	101,650
GR.TOTAL	65	87	1,055,082	2.4	15	1,055,082

"*" Stat area totals have been combined to protect vessel confidentiality.

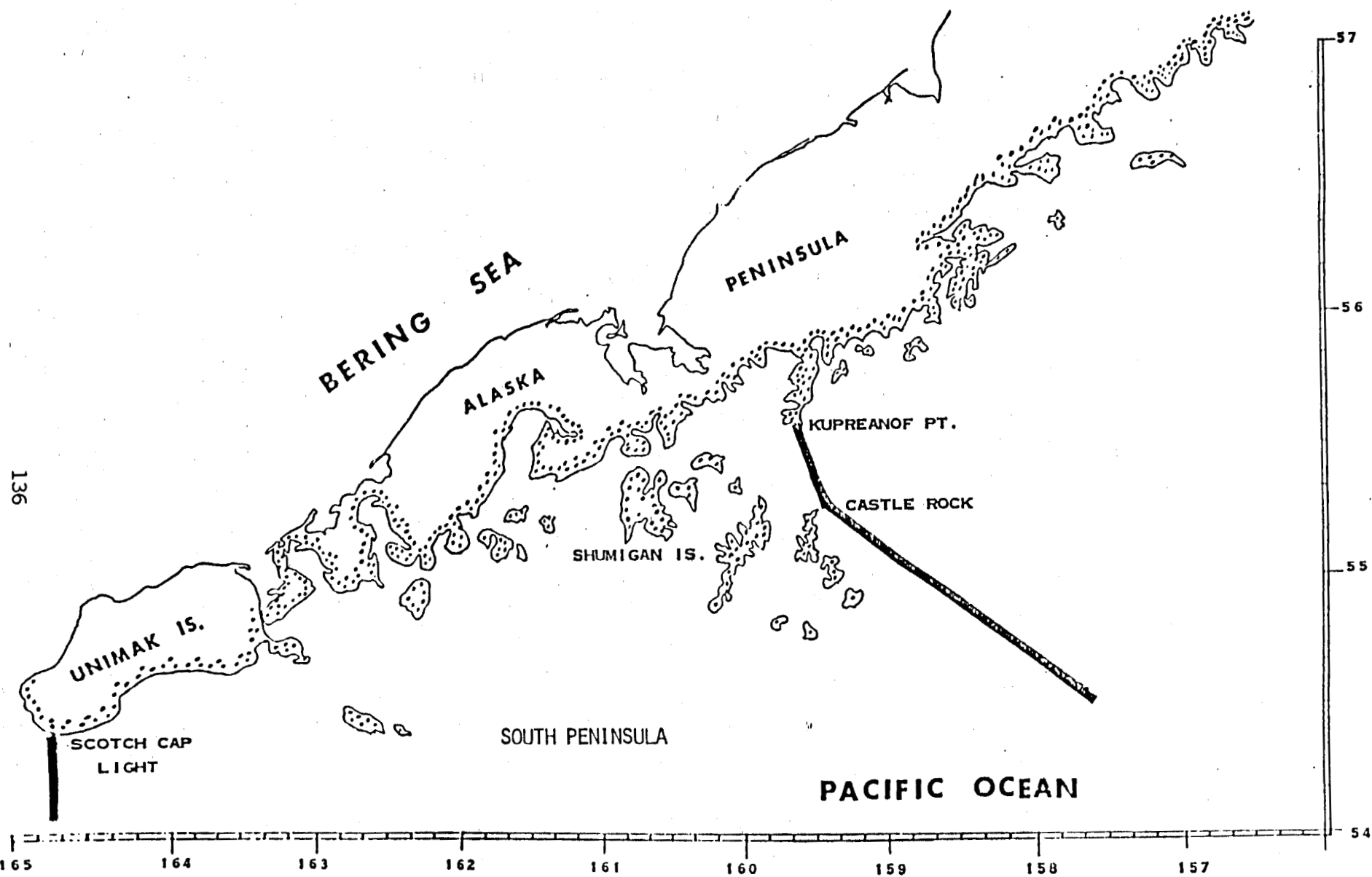


Figure 1. South Peninsula Tanner crab district.

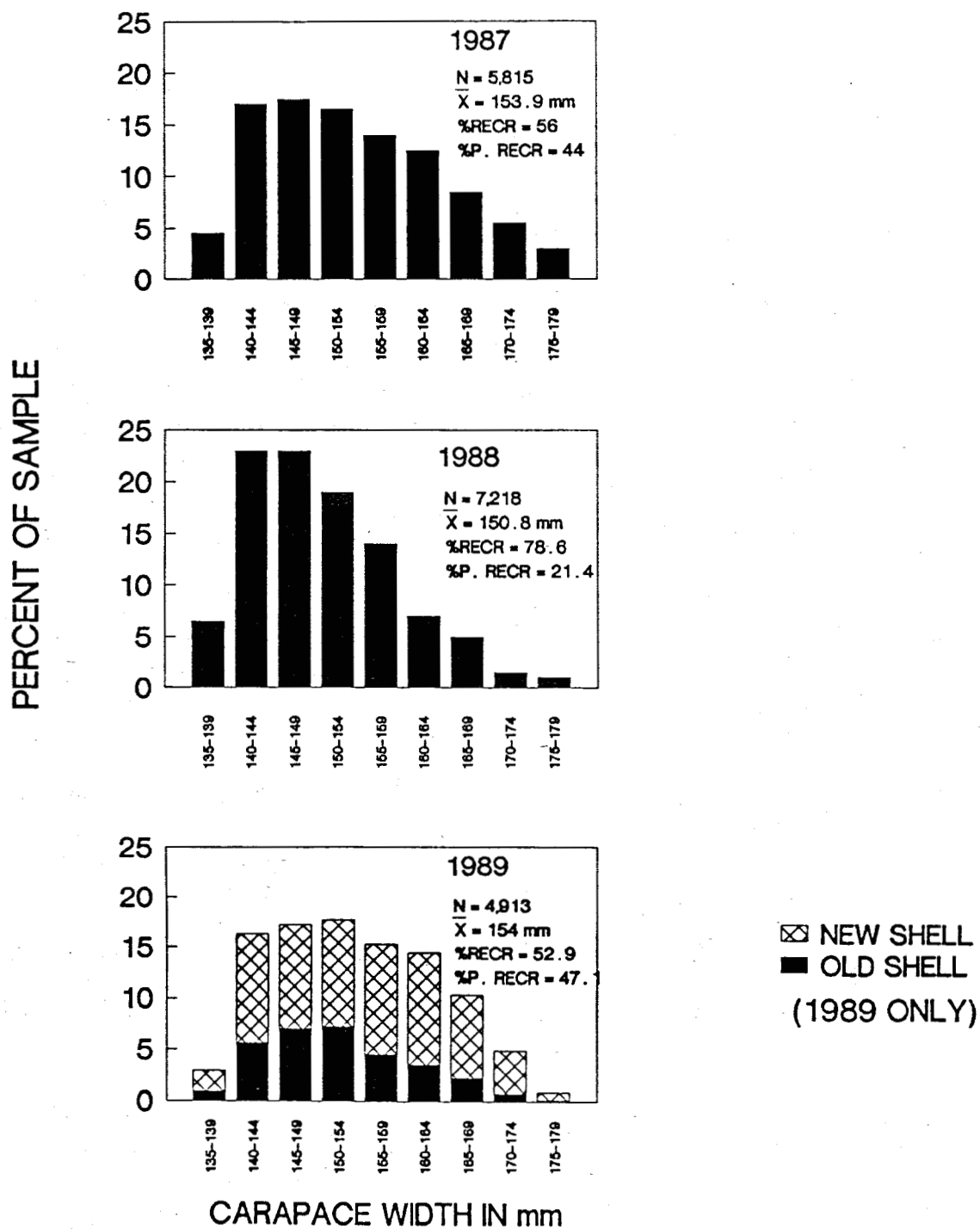


Figure 2. Tanner crab width frequencies from the commercial fishery, South Peninsula District, 1987-1989

ALASKA PENINSULA DUNGENESS CRAB

INTRODUCTION

The Alaska Peninsula District is described as all waters of Statistical Area J west of the longitude of Cape Kumlik ($157^{\circ} 27'$ W. long.) and east of the longitude of Scotch Cap Light ($164^{\circ} 44'$ W. long.) (Figure 1).

Historically, Dungeness catches from the District have been sporadic with the highest catch recorded in 1968 when 1.26 million pounds were landed (Table 1). Subsequent effort and catches remained low for many years due to low prices and better prospects in other fisheries. During the early 1980's, the decline in king crab stocks and a stronger market for Dungeness generated a renewed interest in the fishery. Effort grew so quickly that the Board of Fisheries made the Alaska Peninsula District a superexclusive registration district in 1983. The superexclusive regulation seems to have reduced effort in the District. The poor catches of the last few seasons probably discouraged participation in the fishery as well.

Management of the Alaska Peninsula District Dungeness fishery has been by sex, size and season or the "3-S system". Only males greater than 6.5 inches in carapace width may be harvested from May 1 until January 1 or February 1 (the exact closing date has varied over the years). No research or abundance surveys have ever been conducted on the Dungeness of the area. Management activity has been limited to monitoring the deliveries and recording the harvest. Recently, the revival of the fishery and the poor condition of other crab fisheries, Department biologists have begun to scrutinize the current management strategy. However, data collected so far has not been adequate to support any changes to the management system.

1989/90 FISHERY

For ease of discussion, the Alaska Peninsula District is divided into two areas, Chignik, and South Peninsula (Figure 1).

CHIGNIK

The 1989 Dungeness fishery opened by regulation on May 1. Some crab were harvested from the Chignik area by less than 4 fishermen.

SOUTH PENINSULA

As in Chignik, the South Peninsula area opened to Dungeness fishing on May 1. Some crab were harvested from the South Peninsula area by less than 4 fishermen.

STOCK STATUS

The small amount of data on the population size and structure in the Alaska Peninsula District is derived from the limited skipper interviews and commercial catch sampling. The Chignik fishery appears to be a recruit fishery as over 92 percent of the 1988 catch, nearly 96 percent of the 1987/88 catch and 76 percent of the 1986/87 catch were recruit crab. (Recruits are assumed to be new-shell legal males less than 194 mm carapace width.) The very small samples taken during the last few seasons make it difficult to draw firm conclusions about the age and size structure of the Chignik Dungeness population.

From 1982/83 to 1985 the South Peninsula Dungeness population appeared to be fairly stable (Table 3). The drastic declines of the 1986 and 1987 harvests seemed to indicate a loss of stability and a significant decline in the population of Dungeness (Table 3). Fishing pressure over the last seven seasons may have reduced the numbers of legal sized crabs that may have accumulated when there

was little interest in the fishery. Though no samples were taken in 1988 or 1987, the 491 crab sampled in 1986 showed that 75 percent of the harvest was made up of recruit crab. Therefore, as in Chignik, the South Peninsula Dungeness harvest appears to be dependent upon yearly recruitment.

Since the Department does not survey the Dungeness population there is no way to predict harvests or recruitment for the 1990 fishery. Dramatic cycles of low and high abundance have been observed in other Dungeness fisheries.

Table 1. Dungeness crab harvest statistics, Alaska Peninsula District.

Year	Vssls.	Lnds.	No. Crab ¹	No. Pounds ¹	Pots Lifted	Avg. CPUE	Price Wt. Per Lb.
1968			434,142	1,259,013		2.9	
1969			411,000	1,056,000			
1970			4,200	13,000			
1971			3,900	11,000			
1972			29,400	65,000			
1973		Harvest Confidential					
1974				NO EFFORT			
1975				NO EFFORT			
1976				NO EFFORT			
1977				NO EFFORT			
1978				NO EFFORT			
1979		Harvest Confidential					
1980				NO FISHING			
1981/82		Harvest Confidential					
1982/83	16	79	357,955	779,600	59,265	6	2.2 \$.75
1983/84	18	132	565,430	1,207,128	113,061	5	2.1 \$.97
1984/85	13	99	294,191	647,497	106,056	3	2.1 \$ 1.38
1985/86	7	31	239,202	488,107	52,117	5	2.0 \$ 1.26
1986/87	6	28	87,925	180,261	30,280	3	2.0 \$ 1.05
1987/88	6	21	88,744	182,706	22,588	4	2.1 \$ 1.11
1988		Harvest Confidential					
1989		Harvest Confidential					

¹ Includes deadloss.

Table 2. Recent Dungeness harvest, Chignik Area.

Season	Vssls.	Lnds.	No. Crab ¹	No. Pounds ¹	Pots Lifted	Avg. Wt.	CPUE
1981/82	NA	NA	NA	1,062	NA	NA	NA
1982/83	7	26	106,635	243,503	11,740	2.3	9
1983/84	16	91	297,707	665,238	64,550	2.2	5
1984/85	6	48	126,176	264,741	54,399	2.2	2
1985			Harvest Confidential				
1986			Harvest Confidential				
1987	4	16	81,393	167,334	19,829	2.1	4
1988			Harvest Confidential				
1989			Harvest Confidential				

Table 3. Recent Dungeness harvest, South Peninsula Area.

Season	Vssls.	Lnds.	No. Crab ¹	No. Pounds ¹	Pots Lifted	Avg. Wt.	CPUE
1981/82	NA	NA	NA	1,062	NA	NA	NA
1982/83	13	53	251,320	536,097	47,525	2.1	5
1983/84	8	41	267,723	541,890	48,511	2.0	6
1984/85	13	44	199,790	394,187	56,007	2.0	4
1985	5	25	204,971	417,183	45,167	2.0	5
1986	5	19	62,237	125,080	19,920	2.0	3
1987			Harvest Confidential				
1988			Harvest Confidential				
1989			Harvest Confidential				

NA = Not Available

¹ Includes Deadloss

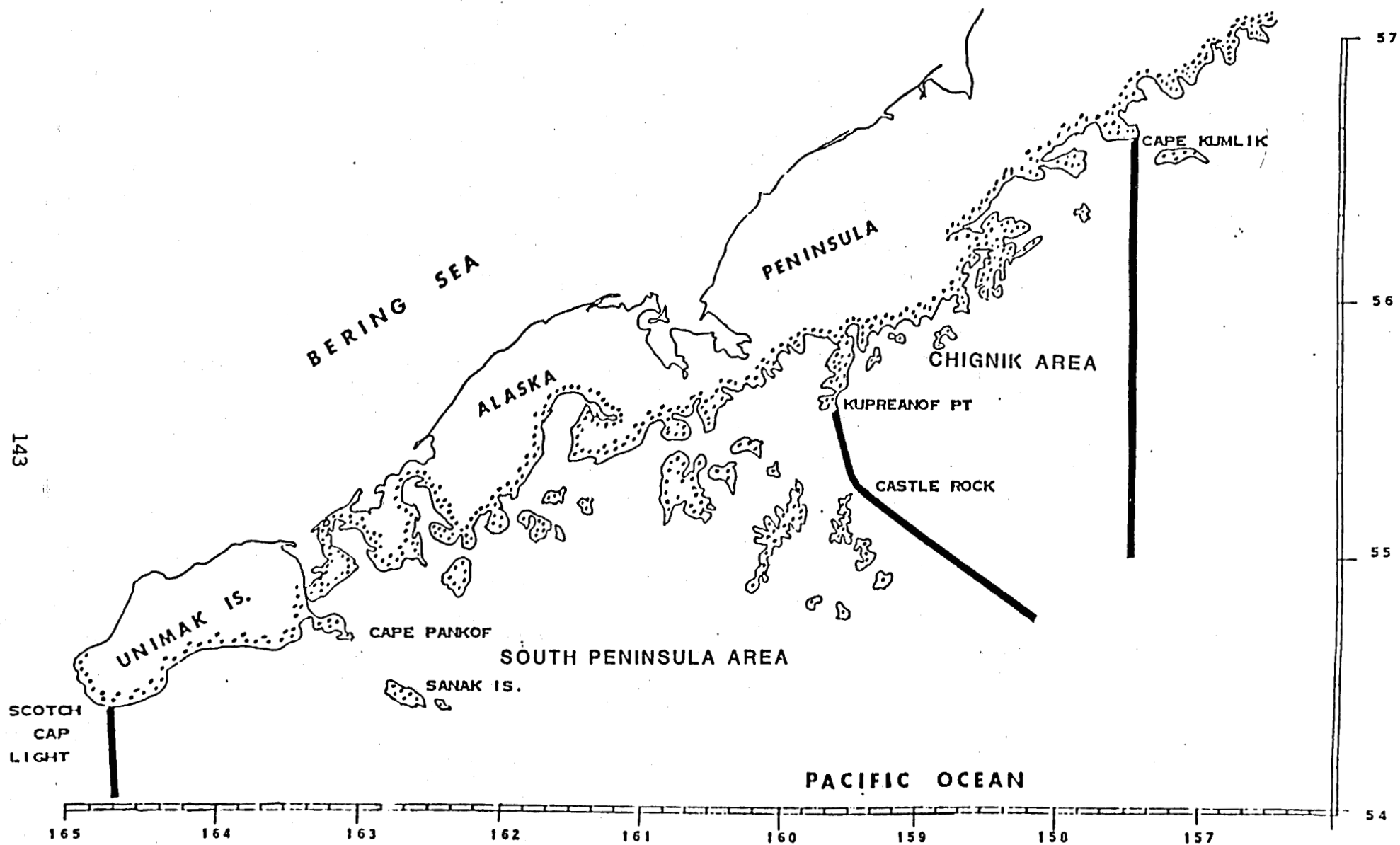


Figure 1. ALASKA PENINSULA DUNGENESS DISTRICT

ALASKA PENINSULA SHRIMP

INTRODUCTION

Shrimp fishing in the Alaska Peninsula began in 1968 when 5.9 million pounds were landed (Figure 1, Table 1). Catch levels remained relatively low until the 1972/73 season when 19.6 million pounds were harvested (Table 1). The historic high catch was reached in 1977/78 with 71.5 million pounds. Catches declined rapidly until all South Peninsula Sections were closed in 1980. Although the Sutwik Island Section and all offshore waters of the Chignik District remained open in 1981/82, only 70,948 pounds of shrimp were landed from the area.

1989/90 SEASON SUMMARY

During the 1989/90 season, none of the inshore shrimp sections were opened to fishing in either the Chignik or South Peninsula Districts. No vessels were registered and no deliveries were made from the offshore sections that remained open to fishing.

STOCK STATUS

The Alaska Department of Fish and game did conduct a trawl survey in the south Peninsula and Chignik Districts during 1989 on board the R/V *Resolution*. A total of 88 shrimp tows, 44 in the Chignik District and 44 in the South Peninsula District, were completed in the 1989 survey. Population estimate from areas traditionally fished in the commercial fishery remained well below levels to warrant a commercial fishery. Survey results yielded only 32 pounds of shrimp per mile trawled in the Chignik District and 12 pounds of shrimp per mile in the South Peninsula District. No significant commercial fishery is expected until predator fish populations decline and shrimp populations recover.

Table 1. Historic shrimp harvest statistics.

SOUTH PENINSULA					CHIGNIK				
Year	Vssls.	Lndgs.	No. Pounds	Price/ Pound	Vssls.	Lndgs.	No. Pounds	Price/ Pound	
1968		Harvest Confidential			-	-	1,153,721	\$.-	
1969		Harvest Confidential			-	-	419,830	.-	
1970	4	173	4,398,800	.04	-	-	890,705	.04	
1971		Harvest Confidential			-	27	1,091,711	.04	
1972/73	-	-	14,740,801	.07	-	-	4,829,117	.-	
1973/74	12	347	19,987,246	.07	33	277	21,673,788	.08	
1974/75	22	387	26,145,720	.08	37	323	23,392,352	.08	
1975/76	24	326	20,044,112	.09	50	334	24,435,480	.08	
1976/77	19	424	37,148,932	.09	48	303	27,232,630	.10	
1977/78	48	409	45,003,794	.13	50	271	26,512,791	.13	
1978/79	23	108	9,418,276	.16	40	201	23,257,869	.17	
1979/80	10	41	3,134,367	.21	35	195	23,722,330	.23	
1980/81	-	-	CLOSED	.-	54	148	12,843,270	.29	
1981/82	-	-	CLOSED	.-	3	4	70,948	.27	
1982/83	-	-	NO DELIVERIES	.-	-	-	NO DELIVERIES	.-	
1983/84	-	-	NO DELIVERIES	.-	-	-	NO DELIVERIES	.-	
1984/85	-	-	NO DELIVERIES	.-	-	-	NO DELIVERIES	.-	
1985/86	-	-	NO DELIVERIES	.-	-	-	NO DELIVERIES	.-	
1986/87	-	-	NO DELIVERIES	.-	-	-	NO DELIVERIES	.-	
1987/88	-	-	NO DELIVERIES	.-	-	-	NO DELIVERIES	.-	
1988/89	-	-	NO DELIVERIES	.-	-	-	NO DELIVERIES	.-	
1989/90	-	-	NO DELIVERIES	.-	-	-	NO DELIVERIES	.-	

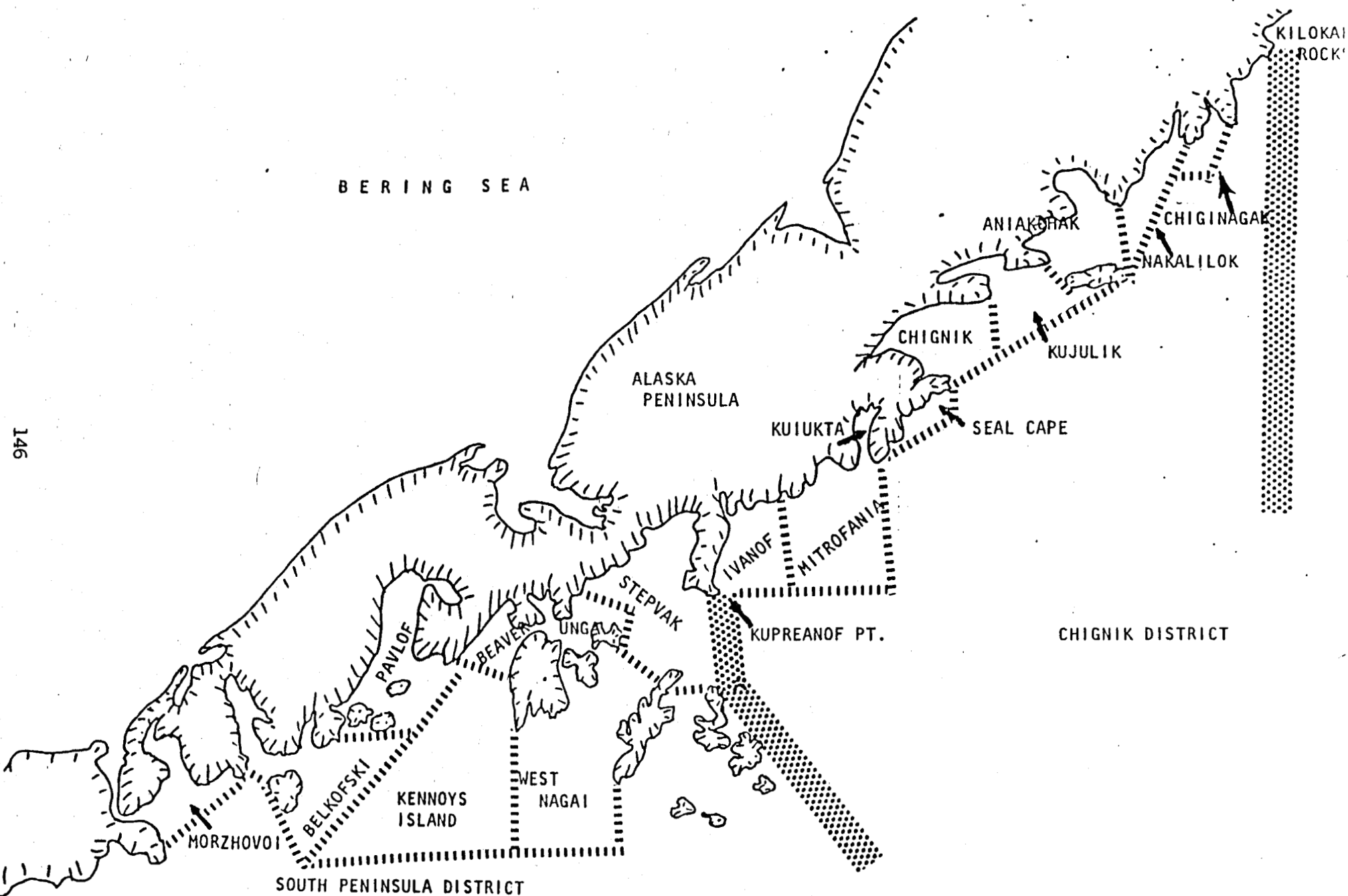


Figure . South Peninsula and Chignik shrimp sections.

ALASKA PENINSULA MISCELLANEOUS SPECIES

Fishermen have occasionally plied the waters of the Alaska Peninsula for snails, pot shrimp, octopus, squid, hair crab, and other less commonly sought species. Octopus was the only species fished in 1989; a more thorough description of this fishery is found below. Discussions of other fisheries appear in previous years' issues of the *Westward Regional Shellfish Report To The Alaska Board Of Fisheries*, Alaska Department of Fish and Game, Kodiak, Alaska.

OCTOPUS

Octopus is the most frequently harvested of the "miscellaneous species" in the Alaska Peninsula District. Processors usually freeze the octopus for resale as halibut bait. Tables 1 and 2 show the historical delivery records of octopus in the districts of the Alaska Peninsula. The tables do not include the octopus caught and retained by fishermen for their own use as food or bait.

Until 1988 octopus were usually taken incidentally during the Tanner crab fishery. Now the octopus are most often taken in trawls targeting on cod and other bottomfish. When the trawls opened the octopus market, fishermen using pot and longline gear began to sell their incidental catch as well.

The 1989 catch of octopus was 14,890 landed by 27 vessels. Little population information is available for the Alaska Peninsula octopus.

Table 1. Historical deliveries of octopus in the Chignik District.

Avg. Year	Vssls.	Lndgs.	Number	Pounds	Lifted	CPUE	Pots	
							Wt.	Price
1980			Harvest Confidential					\$.70
1981			Harvest Confidential					\$.70
1982			Harvest Confidential					\$.70
1983				N O	F I S H I N G			
1984				N O	F I S H I N G			
1985			Harvest Confidential					\$.70
1986				N O	F I S H I N G			
1987				N O	F I S H I N G			
1988			Harvest Confidential					\$.75
1989	4	9	NA	902				\$1.00

Table 2. Historical deliveries of octopus in the South Peninsula District.

Year	Vssls.	Lndgs.	Number	Pounds	Pots Lifted	CPUE	Avg. Wt.	Price
1980				N O	F I S H I N G			
1981				N O	F I S H I N G			
1982			Harvest Confidential					\$.50
1983			Harvest Confidential					\$.80
1984				N O	F I S H I N G			
1985			Harvest Confidential					\$.50
1986				N O	F I S H I N G			
1987				N O	F I S H I N G			
1988	29	184	NA	43,282		NA	NA	\$.92
1989	23	113	NA	13,988				\$1.00

EASTERN ALEUTIANS MANAGEMENT AREA

SHELLFISH MANAGEMENT REPORT

TO

ALASKA BOARD OF FISHERIES

MARCH 1990

BY

KENNETH L. GRIFFIN - AREA MANAGEMENT BIOLOGIST

Dutch Harbor Area Office

P. O. Box 308

Dutch Harbor, Alaska 99692

(907) 581-1239

DUTCH HARBOR RED KING CRAB

INTRODUCTION

The Dutch Harbor area or Statistical Area 'O', has as its eastern boundary the longitude of Scotch Cap Light on Unimak Island, and as its western boundary 171° West longitude. The 800 fathom depth contours are the seaward boundaries. Area 'O' is further broken down into five fishing districts (Figure 1). Although red king crab is the primary target species, brown king crab production is on the increase.

HISTORIC BACKGROUND

The Area 'O' red king crab fishery began in 1961 and rapidly became one of the State's major production areas. During the development years of the fishery, the catch peaked at an all time high of 32.9 million pounds in 1966/67.

Since 1966/67 the fishery has fluctuated widely. A sharp decline characterized the fishery between 1967 and 1970 (Table 1). After the low 1969/70 catch of 8.9 million pounds, the fishery gradually rebuilt to a peak of 15.9 million pounds during the 1975/76 season (Table 1). The increase appeared to be largely a result of improved catches in the Egg Island District, and expansion into new grounds of the Western District.

For the second time in the history of the fishery, a sharp decline followed several years of increasing harvests, and the 1977/78 season marked a new low in the Area 'O' fishery (Table 1). The decline was area wide, and all districts suffered poor catches.

By 1980/81 catches had reached the highest level in 13 years, and although populations had rebuilt somewhat in several of the districts, the bulk of the increase was due to the exploitation of previously unfished populations in the Unalaska and Western

Districts (Table 1). In 1980/81 nearly 39 percent of the catch came from areas only lightly fished during previous seasons.

1989 FISHERY

The Department of Fish and Game was unable to survey the Dutch Harbor king crab stocks during 1988. Vessel commitments due to budget restraints precluded any survey in the area this year.

The 1987 survey and historical trends of Dutch Harbor stocks indicated an extremely low level of king crab abundance in areas of historic importance. Recruitment was extremely weak for both males and females. Any improvement in the condition of stocks would require several years for prerecruit crabs to recruit to legal size.

Based on the poor conditions observed during the 1987 survey of the Dutch Harbor king crab stocks, and no prospects for a short term turnaround in stock condition, the Dutch Harbor 1989/90 red and blue king crab fishery did not open to commercial fishing.

Table 1. Dutch Harbor, Area 'O', historic red king crab catch.

Season	Opened	Closed	Vessels	Landings	Crab ¹	Pounds ¹	Pots Lifted	Avg. Wt.	CPUE	Min. Size	Avg. Price Per #
1968/69	01/01 ²	03/15	NA	NA	NA	11,300,000	NA	NA	NA	7.0"	NA
1969/70	09/15	02/15	41	375	NA	8,950,000	72,683	NA	NA	7.0"	NA
1970/71	09/15	01/10	32	268	NA	9,652,000	56,198	NA	NA	7.0"	NA
1971/72	09/15	10/23	32	210	1,447,692	9,391,615	31,531	6.5	46	6.5"	NA
1972/73	10/01	10/24	51	291	1,500,904	10,450,380	34,037	7.0	44	6.5"	NA
1973/74	11/01	11/24	56	290	1,780,673	12,722,696	41,840	7.1	43	6.5"	\$.65
1974/75	11/01	01/14	87	372	1,812,647	13,991,129	71,821	7.7	25	6.5"	\$.37
1975/76	11/01	01/10	79	369	2,147,350	15,906,666	86,874	7.4	25	6.5"	\$.42
1976/77	11/01	12/07	72	226	1,273,298	9,367,965	65,796	7.4	10	6.5"	\$.64
	12/13	01/13	38	61	86,619	830,458	17,298	9.6	5	8.0"	\$.79
1977/78	09/15	12/08	33	227	539,656	3,658,860	46,617	6.8	12	6.5"	\$.99
	12/08	01/05	6	7	3,096	25,557	812	8.3	4	7.5"	\$1.35
1978/79	09/10	11/20	60	300	1,233,758	6,824,793	51,783	5.5	24	6.5"	\$1.35
1979/80	09/10	01/10	104	542	2,551,116	15,010,874	120,554	5.9	21	6.5"	\$.90
1980/81	11/01	01/12	114	830	2,772,287	17,660,642	231,607	6.4	12	6.5"	\$1.02
	01/15	02/15	54	120	182,349	1,392,923	30,000	7.6	6	7.5"	\$1.03
1981/82	11/01	02/15	92	683	741,966	5,155,345	220,087	6.9	3	6.5"	\$2.30
1982/83	11/01	01/15	81	278	64,380	431,179	72,924	6.7	1	6.5"	\$3.43
1983/84					C L O	S E D					
1984/85					C L O	S E D					
1985/86					C L O	S E D					
1986/87					C L O	S E D					
1987/88					C L O	S E D					
1988/89					C L O	S E D					
1989/90					C L O	S E D					

¹ Includes deadloss

² Prior to 1968/69 fishery was open 12 months/year. 1968/69 season ran 1-1-68 to 3-15-69

DUTCH HARBOR BROWN KING CRAB

HISTORICAL BACKGROUND

Historically, Dutch Harbor brown king crab have been taken incidental to red king crab. Due to few brown king crab being landed, no landings were recorded prior to the 1981/82 season.

During the 1981/82 season, six vessels landed over 115,000 pounds during the on going red king crab season. Only one landing occurred during January, 1982, and the season closed along with the area red king crab season on January 15, (Tables 1 and 2).

Interest in the fishery continued to grow and during the 1982 and 1983 seasons, 49 vessels landed over 1.1 million pounds in the Area's first directed brown king crab fishery, (Table 1). As red king crab stocks continued to decline, effort and interest continued into the 1983/84 season, and 1.8 million pounds was landed by 47 vessels, (Table 1).

In 1984, the Board of Fisheries adopted staff proposals to lower the brown king crab size limit from 6½ inches to 6 inches and established the area as a permit fishery to allow for expansion into other areas outside the historic fishing grounds. During the 1984 permit season, prices and effort dropped, but 13 vessels managed to land 1.5 million pounds, (Tables 1 and 2). Since the permit system was implemented, the fishery has averaged over 1.6 million pounds per year. All landings have occurred from historic grounds developed during the 1982/83 season.

During the 1988 Spring Shellfish meetings, the Board of Fisheries adopted the staff proposal removing the permit fishery designation and set an opening date of September 1.

1989/90 FISHERY

The fishery opened at 12:00 noon, September 1, concurrent to the blue king crab fishery at St. Matthew Island. Registrations and tank inspections were given to eleven vessels, including three catcher/processors.

As in the fisheries of the past seven years, the fishing effort concentrated on historical grounds in the Bering Sea and Pacific Ocean around the Islands of Four Mountains. With the opening of the Bristol Bay red king crab season on September 25, all but four vessels left the area to fish red king crab. Two of the original three catcher processors re-entered the fishery in October, again changing areas when the Adak fisheries opened on November 1. Over half the season's catch, 859,558 pounds, was taken in September, (Table 3). As effort levels decreased in December and January, catch from the area also decreased.

A total of 14 vessels, including four catcher processors fished the area through January of the 1989/90 season, catching 1.7 million pounds, the best catch since the 1985 fishery (Table 2). The season will close on February 15, 1990 and at the time of this writing, only three vessels are fishing. The expected season harvest is estimated to be at 1.8 million pounds.

STOCK STATUS

The Dutch Harbor brown king crab stocks are not surveyed, but mandatory observers have been on the catcher processors that fished the area. This information is the first collected from the fishing grounds and will provide valuable information on the Area.

Table 1. Historic brown king crab catch in Dutch Harbor statistical Area '0'.

Season	Vssls.	Lndgs.	No. Crab ¹	No. Pounds ¹	Pots Lifted	CPUE	Percent Oldshell	Avg. Wt.	Avg. Length	Pounds Deadloss
1981/82	6	16	22,666	115,715	2,906	8	3.8	5.1	158.1	8,752
1982/83	49	136	227,471	1,184,971	29,369		8	5.2	158.1	47,479
1983/84	47	132	328,353	1,810,973	29,595	11	NA	5.5	NA	45,268
1984 ²	13	67	327,440	1,521,142	24,044	14	NA	4.6	161.2	70,362
1985	13	67	410,977	1,968,213	34,287	12	16	4.7	155.7	38,663
1986	17	71	400,389	1,869,180	37,585	11	-	4.7	NA	9,510
1987	22	77	299,734	1,383,198	43,017	7	25	4.6	149.6	24,210
1988 ³	21	57	323,695	1,,545,113	40,869	8	23	4.8	154.3	22,960
1989/90 ⁴	13	70	424,067	1,852,249	43,345	10	30	4.4	150.9	17,421

¹ Includes deadloss

² Six inch permit season opened July 1

³ Season opening date established September 1

⁴ Preliminary - Season in progress

Table 2. Brown king crab harvest composition, Area 'O', Dutch Harbor.

Season	Season Opened	Season Closed	No. Pounds ¹	Size Limit	Price/ Pound
1981/82	11/01	01/15	115,715	6-1/2"	\$ 2.05
1982/83	11/01	02/15	1,284,971	6-1/2"	\$ 3.00
1983/84	11/10	02/15	1,810,973	6-1/2"	\$ 3.05
1984 ²	07/01	12/31	1,521,142	6"	\$ 1.35
1985	01/01	02/15	177,995	6"	\$ 1.70
	07/01	10/31	1,799,656	6"	\$ 2.00
1986 ²	07/01	12/31	1,869,180	6"	\$ 2.85
1987	07/01	09/02	1,383,198	6"	\$ 2.85
1988	09/01	12/04	1,545,113	6"	\$ 3.00
1989/90	09/01	12/15	1,721,219	6"	\$ 3.50

¹ Deadloss included² Partial closure 9/27 west of 169° 30'

Table 3. 1989/90 preliminary Dutch Harbor brown king crab catch by month.

Month	Vssls.	Lndgs.	No. Crab ¹	No. Pounds ¹	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
Sept	10	19	195,129	870,558	16,995	4.5	11	11,771
Oct	8	20	118,093	490,846	10,877	4.2	11	0
Nov	6	10	47,065	206,530	5,697	4.4	8	4,050
Dec	5	10	28,713	128,700	4,915	4.5	6	400
Jan			Confidential					
Feb	4	6	20,780	90,727	3,024	4.4	4	1,200
Season Total	13	70	424,067	1,852,249	43,345	4.4	10	17,421

¹Deadloss included

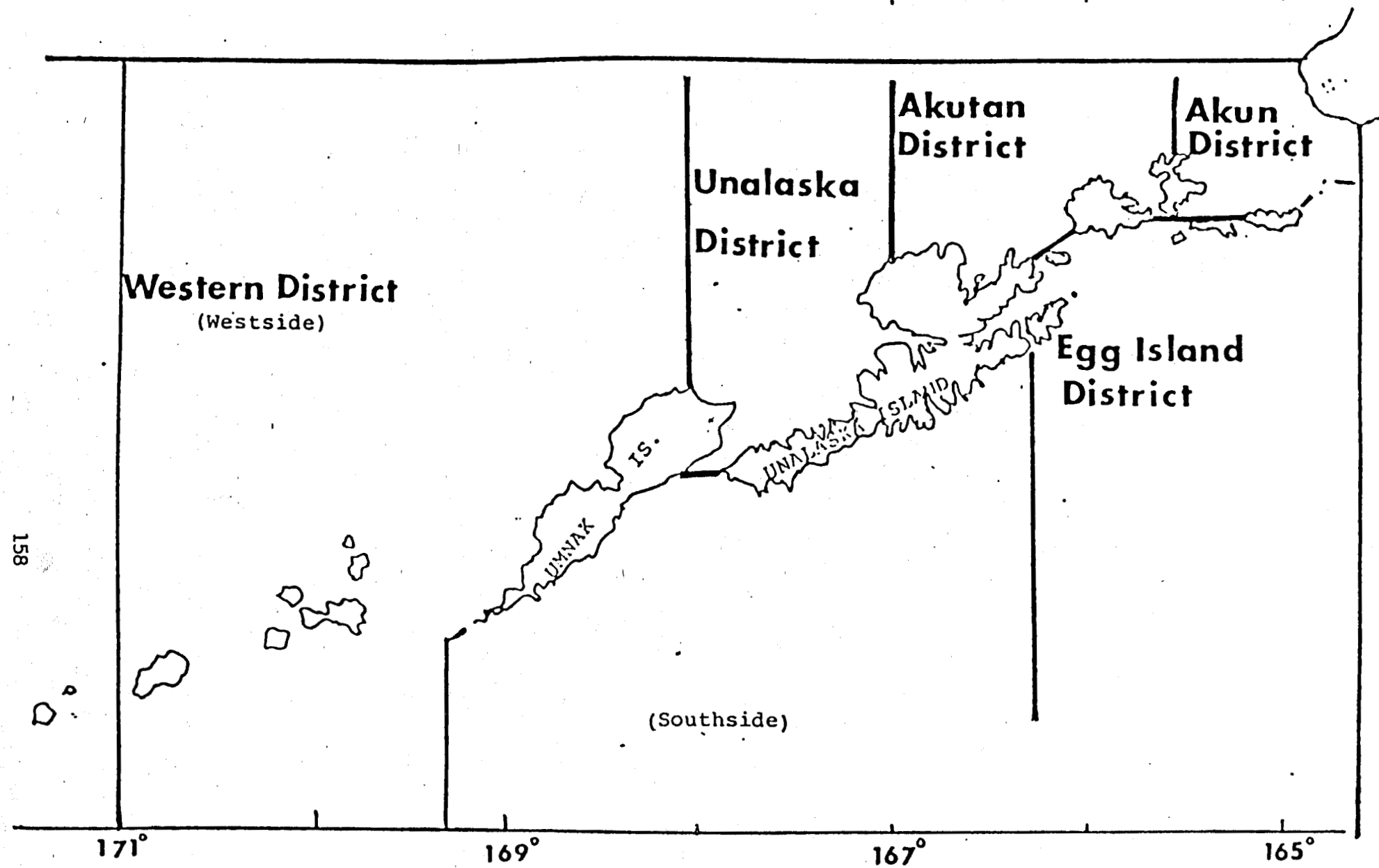


Figure 1. Dutch Harbor Statistical Area "0" and Districts.

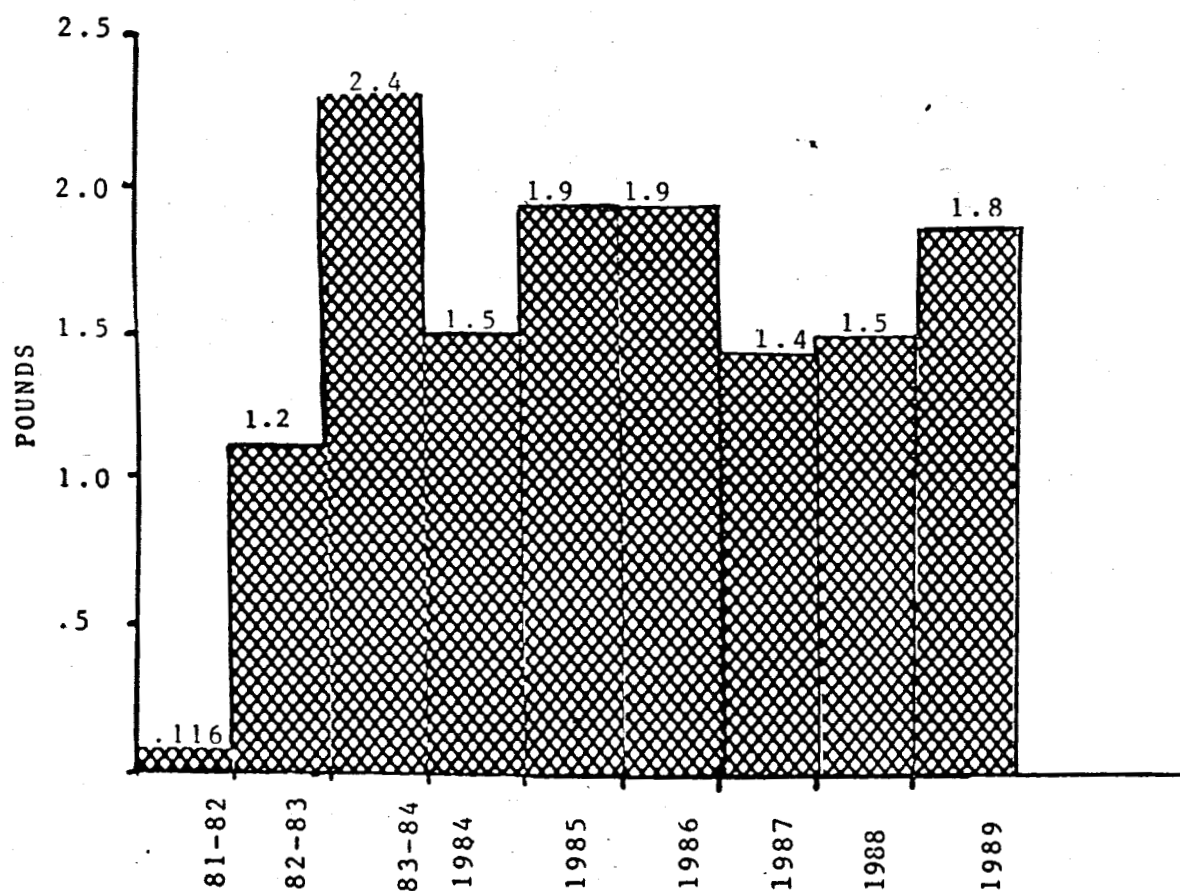


Figure 2. Historic Dutch Harbor brown king crab catch by season.

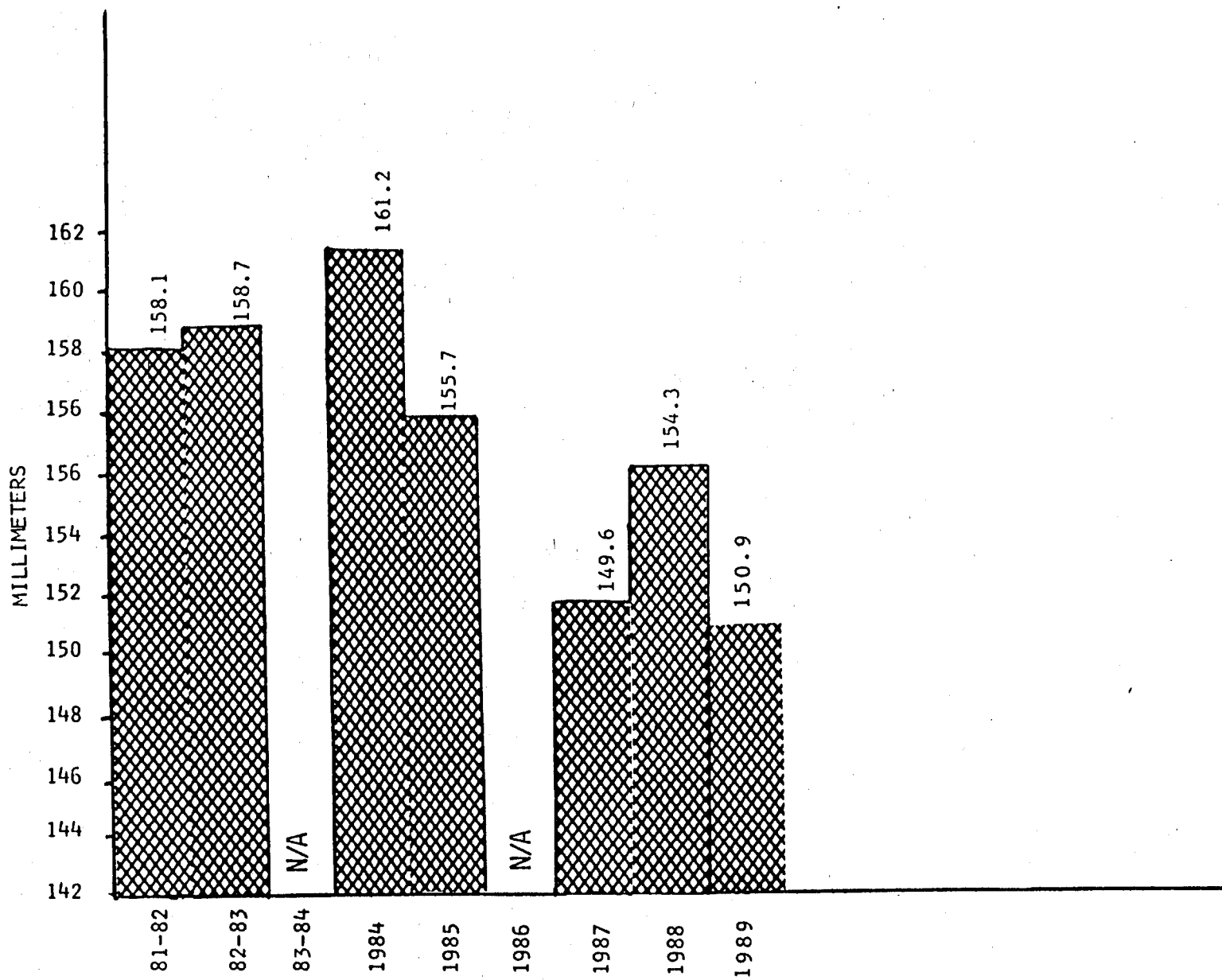


FIGURE 3. HISTORIC DUTCH HARBOR BROWN KING CRAB LENGTH FREQUENCIES.

EASTERN ALEUTIAN TANNER CRAB

INTRODUCTION

The Eastern Aleutian District's habitats are marginal for *Chionoecetes bairdi*, evidenced by the fact that the crab are found only in commercial quantities in a few of the major bays and inlets. The fishery has been rather small and although the 1977/78 season produced a record 2.4 million pounds, seasonal catches have remained significantly less than one million pounds (Table 1). The fishery began with vessels fishing the waters of Akutan and Unalaska Bays but has since expanded to include all areas known to be inhabited by Tanner crab.

1989 FISHERY

The fishery opened at 12:00 noon, January 15 with ten vessels receiving initial tank inspections and registrations. Several larger vessels registered for the area prior to going to the Bering Sea which attributed to the largest catch (over 326,000 pounds) since the 1983 fishery (Table 1). As in past fisheries in the Eastern Aleutian District, most effort is by smaller local boats fishing in Unalaska Bay which accounted for 26 percent (86,400 pounds) of the season total (Table 3). Other significant areas during the 1989 season were the outside waters of Unalaska Bay (40,000 pounds), and outer Makushin Bay (72,600 pounds) (Table 3).

A total of twelve vessels landed over 326,000 pounds from the district in 1989. Average catch per pot declined from thirteen crab in January to five crab per pot in May when the fishery closed concurrent to the closure of the Bering Sea *C. bairdi* fishery (Table 2).

STOCK STATUS

The status of the Eastern Aleutian Tanner crab stocks are unknown, but appear to remain stable based on the commercial catches. Vessel effort is expected to remain stable with smaller, local vessels fishing in the local bays and a few larger vessels fishing bays further away from Dutch Harbor.

Table 1. Historic 5½ inch *Chionoecetes bairdi* fishery statistics from the Eastern Aleutian District.

Season	Opened	Closed	Vessels	Landings	Crab ¹	Pounds ¹	Pots Lifted	Average Weight	CPUE	Price per Pound
1973/74	10/1	7/31	6	14	210,539	498,836	NR ²	2.4	60	\$.NR
1974/75	1/18	10/15	2	3	34,712	77,164	856	2.2	41	.102
1975/76	1/20	10/15	8	13	219,166	534,295	4,646	2.4	47	.196
1976/77	11/7	6/15	12	35	544,755	1,239,569	9,640	2.3	57	.30
1977/78	11/1	6/15	15	198	1,104,631	2,494,631	2,494,488	1.3	37	.38
1978/79	11/1	6/15	20	174	542,081	1,280,115	18,618	2.4	20	.52
1979/80	11/1	6/15	18	107	352,819	886,487	18,040	2.4	20	.52
1981	1/15	6/15	29	119	264,238	654,514	21,771	2.4	12	.58
1982	2/15	6/15	31	138	332,260	739,694	30,109	2.2	11	1.25
1983	2/15	6/15	23	107	250,774	547,830	22,168	2.1	11	1.20
1984	2/15	6/15	16	91	104,761	239,585	11,069	2.3	9	.98
1985	1/15	6/15	6	56	71,918	165,529	5,620	2.3	13	1.30
1986	1/15	6/15	9	37	73,187	167,339	10,244	2.3	7	1.50
1987	1/15	6/15	7	63	71,338	160,292	5,294	2.2	13	2.00
1988	1/15	4/10	19	130	129,468	309,918	11,011	2.4	12	2.10
1989	1/15	5/7	12	109	144,746	326,396	14,685	2.2	10	2.90

Note: This page contains some confidential information not for public distribution.

¹Deadloss included beginning 1980

²No record

Table 2. *Chionoecetes bairdi* catch by month for the Eastern Aleutian district for 1989 season.

Month	Vessels	Landings	Crab	Pounds	Pots Lifted	Avg. Wt.	CPUE	Dead- loss (#s)
Jan	10	15	31,751	73,388	2,362	2.3	13	100
Feb	11	40	58,046	130,050	4,772	2.2	12	2,000
Mar	10	30	37,620	84,184	4,778	2.2	8	200
Apr	7	18	15,091	34,224	2,613	2.3	6	0
May	4	6	2,238	4,550	460	2.0	5	0
TOTAL	12	109	144,746	326,396	14,985	2.3	10	2,300

Table 3. *Chionoecetes bairdi* catch by statistical area for the Eastern Aleutian District, 1989.

Area	Landings	Crab	Pounds	Pots Lifted	Avg. Weight	CPUE	Deadloss (#s)
665332	25	11,277	26,265	2,679	2.3	4	0
665335	46	39,338	86,472	4,195	2.2	9	300
665336	4	14,789	32,186	1,370	2.2	11	0
665403	24	18,116	40,438	1,879	2.2	10	2,000
675331	4	30,963	72,633	2,437	2.3	13	0
All Others	6	30,263	68,402	2,125	2.3	14	0
TOTAL	109	144,746	326,396	14,685	2.3	10	2,300

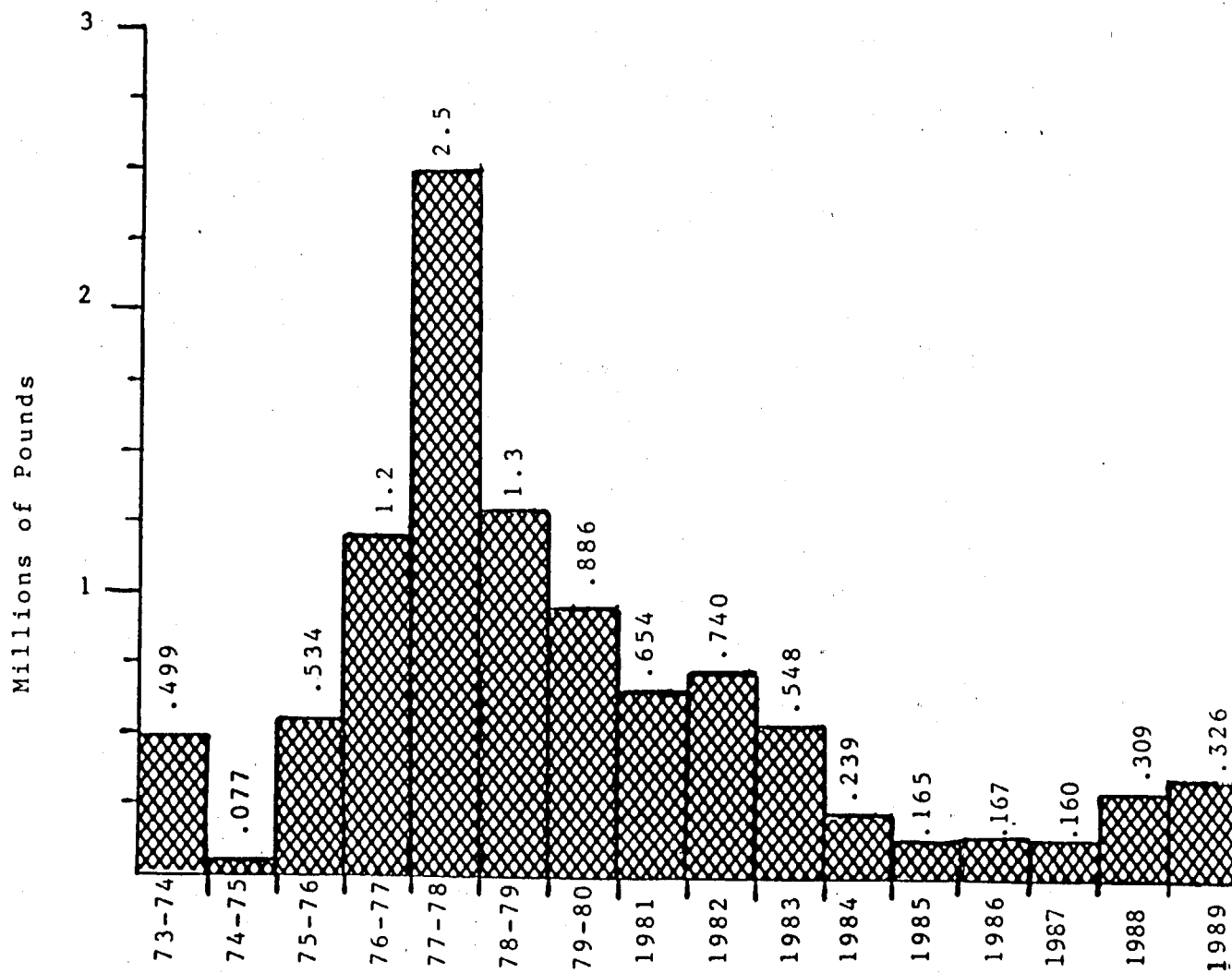


Figure 1. Eastern Aleutian Tanner Crab Historical Catch.

ALEUTIAN DUNGENESS CRAB

INTRODUCTION

The Aleutian District includes all water of statistical Area 'J' west of the longitude of Scotch Cape Light and south of the latitude of Cape Sarichef and encompasses all the Aleutian Islands.

The islands in the Aleutian chain are separate from each other by deep passes and swift currents and are closely bordered on the north and south by deep trenches. Red and brown king crab are found in the deep waters adjacent to the "Chain", but the Dungeness crabs prefer the shallower bays. These shallow areas suitable to Dungeness populations are few, helping to explain the low effort and small Dungeness populations in the district.

HISTORICAL BACKGROUND

The Aleutian District fishery is primarily a small vessel, summer fishery occurring in the vicinity of Unalaska Island and within Unalaska Bay. Some larger vessel effort has occurred in other Bays on the Island, but continued long term effort in these areas has been sporadic throughout the history of the fishery.

Interest and activity in the fishery has been very erratic from year to year, with the first reliable reports made in 1970. The greatest catch reported prior to the 1984/85 fishery was 60,517 pounds reported in 1974, (Table 1). Since 1974, deliveries have ranged from zero in 1976, 1977, 1980, and 1981 to over 91,000 pounds reported in 1984/85, (Table 1).

1989 FISHERY

The Eastern Aleutian District opened by regulation to fishing on May 1. Effort in the fishery did not get under way until June and then only by a local skiff, (Table 2). Effort in the fishery this year was by small local boats delivering to one shore based plant or selling live crab at the docks. This year's catch of 11,124 pounds is half of last season's catch.

Table 1. Historic Dungeness crab catch and associated data in the Aleutian District.

Year	Season	Vessels	Landings	Crab	Pounds	Pots Lifted	Avg. Wt.	CPUE	Price Per Pound
1974	1-1/12-31		Confidential						
1975	1-1/12-31		Confidential						
1976	5-1/12-31		N O C A T C H						
1977	5-1/12-31		N O C A T C H						
1978	5-1/12-31		Confidential						
1979	5-1/12-31		Confidential						
1980	5-1/12-31		N O C A T C H						
1981	5-1/2-1		N O C A T C H						
1982/83	5-1/2-1		Confidential						
1983/84	5-1/2-1		Confidential						
1984/85	5-1/2-1	4	50	40,128	91,739	13,555	2.3	3	\$1.15 - \$1.50
1985	5-1/12-31		Confidential						
1986	5-1/12-31		Confidential						
1987	5-1/12-31	5	43	13,247	26,627	2,987	2.0	4	\$.95
1988	5-1/12-31	6	45	10,814	22,634	2,581	2.1	4	\$.90
1989	5-1/12-31	4	31	5,165	11,124	2,078	2.1	2	\$.90

ALEUTIAN TRAWL SHRIMP

INTRODUCTION

The Aleutian shrimp district of Area 'J' includes all waters west of the longitude of Cape Sarichef. The Aleutian District includes four separate sections: Unalaska Bay, Makushin Bay, Usof Bay and Beaver Inlet.

HISTORIC BACKGROUND

Shrimp has been fished in the Aleutian District since 1972. (Table 1). Catch and effort increased in subsequent years to a peak of 6.8 million pounds in 1977/78 (Table 1). Since 1978 the Aleutian shrimp fishery has suffered sharp declines in catches and reduced seasons (Tables 1).

1989 FISHERY

There was no trawl fishery during 1989, although most of the unquoted areas were open.

STOCK STATUS

Though there have been no surveys in the Aleutian District since October 1983, shrimp stocks probably remain in a severely depleted condition.

Table 1. Historical trawl shrimp fishery statistics for the Aleutian District.

Season ¹	Opened	Closed	Vessels	Landings	Tows	Pounds	Average Price per Lb.
1972	1/72	12/72		Confidential			
1973	1/73	12/73		Confidential			
1974	1/74	12/74	7	88	721	5,749,407	NR
1975	1/75	12/75		Confidential			
1976	1/76	12/76	8	66	689	3,670,609	\$.072
1977-78	2/77	3/78	7	93	1,372	6,800,393	\$.12
1978-79	4/78	3/79	7	74	1,007	4,946,350	\$.15
1979-80	4/79	2/80	7	68	799	3,292,049	\$.20
1980	3/80	12/80	4	60	711	2,454,829	\$.23
1981	3/81	12/81	6	45	551	2,185,326	\$.22
1982-83	5/82	6/83		Confidential			
1983			N O	F I S H I N G			
1984			N O	F I S H I N G			
1985			N O	F I S H I N G			
1986			N O	F I S H I N G			
1987			N O	F I S H I N G			
1988			N O	F I S H I N G			
1989			N O	F I S H I N G			

¹ Season years: 1972 to 1976 by calendar year. 1977/78 ran February 1977 to March 1978. 1978/79 and 1979/80 April to March. 1980/81 hence March to February.

WESTERN ALEUTIANS MANAGEMENT AREA

SHELLFISH MANAGEMENT REPORT

TO

ALASKA BOARD OF FISHERIES

MARCH 1990

BY

KENNETH L. GRIFFIN - AREA MANAGEMENT BIOLOGIST

Dutch Harbor Area Office

P. O. Box 308

Dutch Harbor, Alaska 99692

(907) 581-1239

ADAK BROWN KING CRAB

HISTORIC BACKGROUND

The Adak (Area 'R') brown king crab fishery began during the 1975/76 season when 25,000 pounds were caught. Occurring incidentally to the red king crab fishery, catches of brown crab were low during the 1975/76 to 1980/81 seasons (Table 1).

Fishermen began to target on brown king crab for the first time during the 1981/82 season when 14 vessels made 76 landings totaling 1.2 million pounds (Table 1). When the fishery first began, most of the catch came from the North Amlia and Petrel Bank Districts, and lately the Western Aleutian District has become a significant producer as well. Lacking the large inter-island passes where brown king crab are most numerous, the other three districts in Area 'R' produce much lower catches. In July 1985, the size limit was reduced from 6.5 to 6 inches.

1989/90 FISHERY (PRELIMINARY REPORT)

The season opened to fishing at 12:00 noon on November 1, concurrent with the red king and Tanner crab fisheries. On October 30, during registration, 50 vessel operators indicated that they intended to target on brown king crab only.

As in the 1988/89 season, catches during November and December produced over two million pounds, (Table 3). As the holiday season approached effort dropped and only a few vessels, including two catcher processors fished throughout the month.

Although large population estimates for both *C. bairdi* and *C. opilio* were published for the Bering Sea, many vessels that were rigged for longlining stayed with the Adak brown king crab fishery rather than entering the single pot Bering Sea fisheries. To date ten

catcher/processors are fishing the area. Due to the remoteness of the area and the fact that actual fish tickets have not been processed, only 166,000 pounds have been logged for January, (Table 3). To date, approximately 3.1 million pounds of brown king crab have been reported from the Adak Area.

Catch statistics for the first three months of both the 1988/89 and 1989/90 seasons are comparable with a catch per pot of six crab, but due to increased effort early in January of 1990, an estimated 400,000 pounds more was landed for the month than for January 1989.

Effort in this fishery is expected to continue to increase slowly until the closure of the Bering Sea Eastern Subdistrict Tanner crab season, when vessels without tendering contracts will again enter into the fishery rather than fish the low priced *C. opilio* in the Western Subdistrict of the Bering Sea. As many as 18 catcher/processors can be expected to be fishing by late April or May. As more vessels with large amounts of longline gear compete for areas to fish, gear and vessel conflicts will occur. Areas that have produced crab are already heavily exploited by the fleet to depths exceeding 400 fathoms, leaving little new ground to be developed.

STOCK STATUS

The Adak brown king crab stocks are not surveyed and the Department has no population estimates. This fishery has provided over 60 million pounds during a seven year period and this year is experiencing an increased fishing effort and development of the fishing grounds to depths over 400 fathoms. Although crab observers have been present for two years, this data is still in the process of being evaluated and hopefully will provide the Department additional information for management in 1990.

Table 1. Historic brown king crab catch in Adak, Area 'R'.

Season	Opened	Closed	Vssls.	Lndgs.	No. Crab ¹	No. Pounds ¹	Pots Lifted	Avg. Wt.	CPUE	Percent Newshell	Avg. Length	Min. Size	Price/ Pound	Deadloss
1975/76	11/01	12/18			Harvest Confidential					N/A	N/A	6.5"	N/A	N/A
1976/77	01/07	04/15			Harvest Confidential					N/A	N/A	6.5"	\$.75	N/A
1977/78	02/20	03/20			Harvest Confidential					N/A	N/A	6.5"	\$1.30	N/A
1978/79	02/21	10/01	0	0	0	0	0	-	-	-	-	6.5"	-	0
1979/80	01/15	04/01			Harvest Confidential					N/A	N/A	6.5"	\$.65	N/A
1980/81	01/15	03/28	4	4	11,523	58,914	700	5.1	17	97.6	158.4	6.5"	\$.90	5,000
1981/82	11/01	06/15	14	76	217,700	1,194,046	24,627	5.5	9	90.5	159.6	6.5"	\$2.06	22,064
1982/83	11/01	04/15	99	501	1,509,001	8,006,274	150,103	5.3	10	92.4	158.2	6.5"	\$3.01	220,743
1983/84	11/10	04/15	157	1,002	1,534,909	8,128,029	226,798	5.3	7	87.8	N/A	6.5"	\$2.92	171,021
1984/85	11/10	07/08	38	85	643,597	3,180,095	64,777	4.9	10	87.5	156.7	6.5"	-	125,073
1985/86 ²	11/01	08/15	49	386	2,452,048	11,024,759	202,401	4.5	12	86.3	151.3	6.0"	-	5,304
1986/87	11/01	08/15	62	525	2,923,947	12,798,004	392,185	4.4	7	69.1	149.5	6.0"	\$3.00	276,736
1987/88	11/01	08/15	46	386	1,908,177	8,001,989	267,705	4.2	7	91.7	146.9	6.0"	\$3.00	165,415
1988/89	11/01	08/15	74	455	2,165,508	9,080,196	280,732	4.2	8	91.2	149.1	6.0"	\$3.20	122,251
1989/90 ³	11/01	-	55	155	548,647	2,298,457	88,569	4.2	6	-	-	6.0"	\$3.75	51,225

¹ Deadloss included² Size limit reduced to six inches³ Season in progress

Table 2. 1988/89 Adak, Area 'R', brown crab catch statistics by month.

Month	Vessels	Lndgs.	No. Crab ¹	No. Pounds ¹	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
November	55	85	200,408	869,259	36,928	4.3	5	8,895
December	53	74	282,117	1,198,380	47,290	4.3	6	49,409
January	15	19	73,404	326,421	9,692	4.5	8	1,300
February	9	22	108,693	466,222	11,187	4.3	10	3,000
March	11	26	205,911	893,778	17,355	4.3	12	10,500
April	12	29	251,620	1,027,758	19,445	4.1	13	4,690
May	22	42	238,679	998,724	23,534	4.2	10	1,917
June	25	53	297,969	1,234,057	43,195	4.1	7	22,428
July	24	71	334,276	1,364,729	46,731	4.1	7	9,112
August	19	34	172,431	700,868	25,375	4.1	7	11,000
Total	74	455	2,165,508	9,080,196	280,732	4.2	8	122,251

¹Deadloss included.

Table 3. Preliminary 1989/90 Adak Area 'R' brown king crab catch statistics by month.

Month	Vessels	Lndgs.	No. Crab	No. Pounds ¹	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
November	53	93	274,450	1,149,536	48,363	4.2	6	14,477
December	33	53	232,372	1,823,455	33,086	4.2	7	29,055
January	6	9	41,825	166,576	7,120	4	6	7,693
Total ²	55	155	548,647	2,298,457	88,569	4.2	6	51,225

¹Deadloss included.²Preliminary figures, season in progress.

Table 4. 1988/89 Adak brown king crab catch by statistical area.

Stat. Area	Lndgs.	No. Crab	No. Pounds	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
715202	39	312,003	1,376,887	32,803	4.4	10	13,996
715231	23	234,918	938,157	27,213	4.0	9	36,102
725201	26	137,550	589,369	20,426	4.3	7	11,463
725203	7	42,745	182,850	5,985	4.3	7	1,883
725230	5	25,656	107,559	2,949	4.2	9	0
735130	10	15,133	81,288	2,965	5.4	5	130
735201	10	23,405	94,340	4,500	4.0	5	525
735230	15	30,529	128,076	5,742	4.2	5	8,575
745131	5	19,326	85,397	2,300	4.4	8	380
745204	4	8,862	38,311	2,270	4.3	4	2,000
755132	14	22,938	106,403	4,836	4.6	5	516
755201	6	8,310	38,224	3,014	4.6	3	0
765131	4	7,437	31,940	1,060	4.3	7	0
765132	17	54,426	237,855	13,419	4.4	4	1,260
785102	6	20,890	87,018	3,557	4.2	6	4,055
785131	12	62,429	268,437	11,233	4.3	6	7,060
785134	6	19,775	83,538	2,073	4.2	10	0
795102	5	20,925	87,490	2,830	4.2	7	4,060
795131	7	21,622	91,665	2,302	4.2	9	0
795132	11	31,977	136,179	3,730	4.3	9	516
795200	11	38,464	159,018	3,275	4.1	12	0
795230	7	13,544	58,855	2,692	4.4	5	0
805103	8	60,917	243,675	7,561	4.0	8	16,207
805131	5	27,537	117,177	1,998	4.3	14	0
805132	12	80,741	332,863	6,604	4.1	12	4,631
805201	21	56,773	240,594	15,186	4.2	4	0
815132	4	16,519	64,705	2,060	3.9	8	50
825201	10	57,779	247,415	4,784	4.3	12	0
835200	15	142,451	579,914	9,608	4.1	15	0
845130	5	26,477	108,355	3,862	4.1	7	618
845201	5	54,489	206,245	1,702	3.8	32	0
845202	21	141,810	555,352	12,300	3.9	12	618
855200	6	18,571	76,497	2,912	4.1	6	0
875232	9	17,537	77,047	4,426	4.4	4	0
885300	9	44,070	202,545	7,205	4.6	6	0
OTHERS	75	246,973	1,018,956	39,350	4.1	6	7,611
TOTAL	455	2,165,508	9,080,256	280,732	4.2	8	122,251

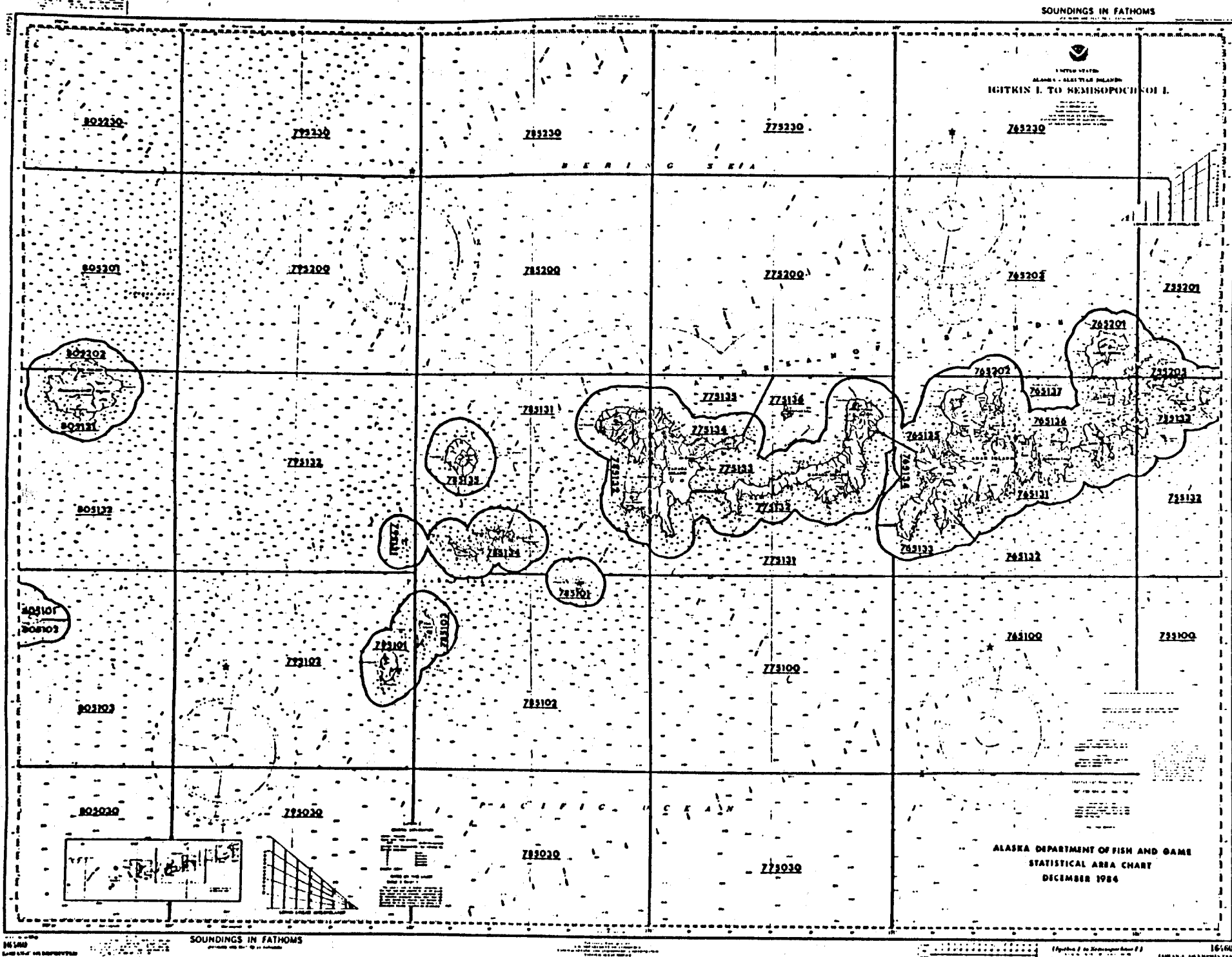


Figure 1. (con't pg. 2) Adak king crab registration Area "R".

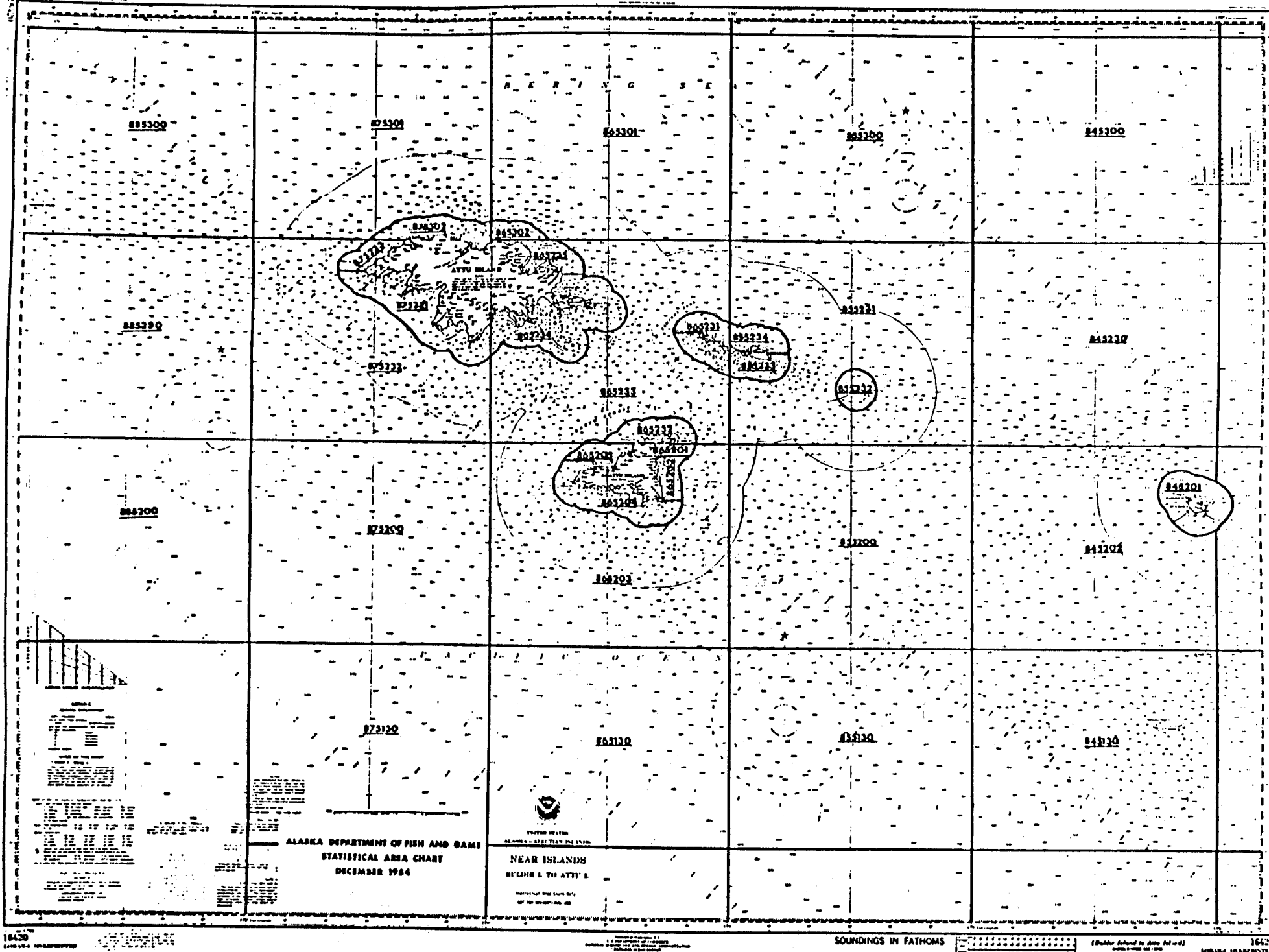
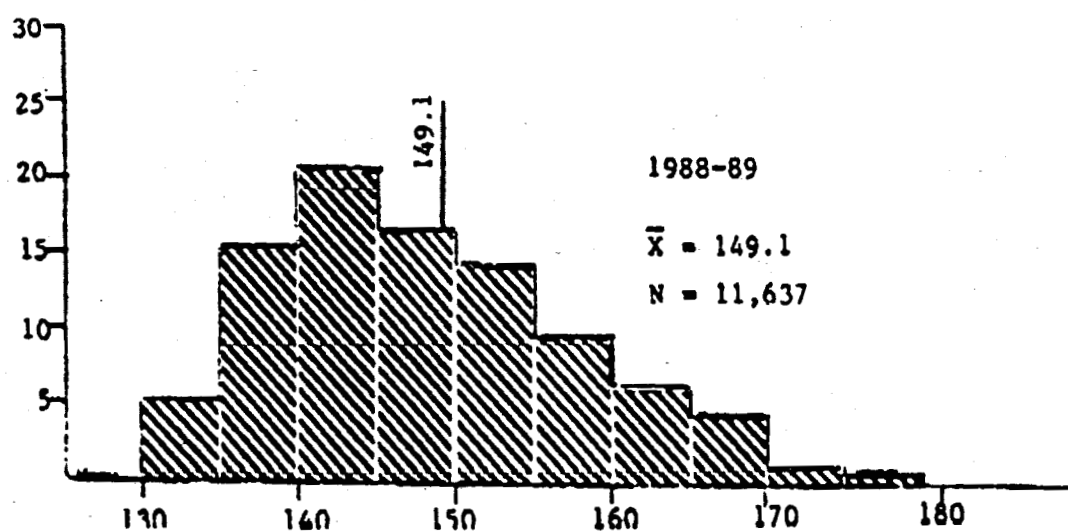
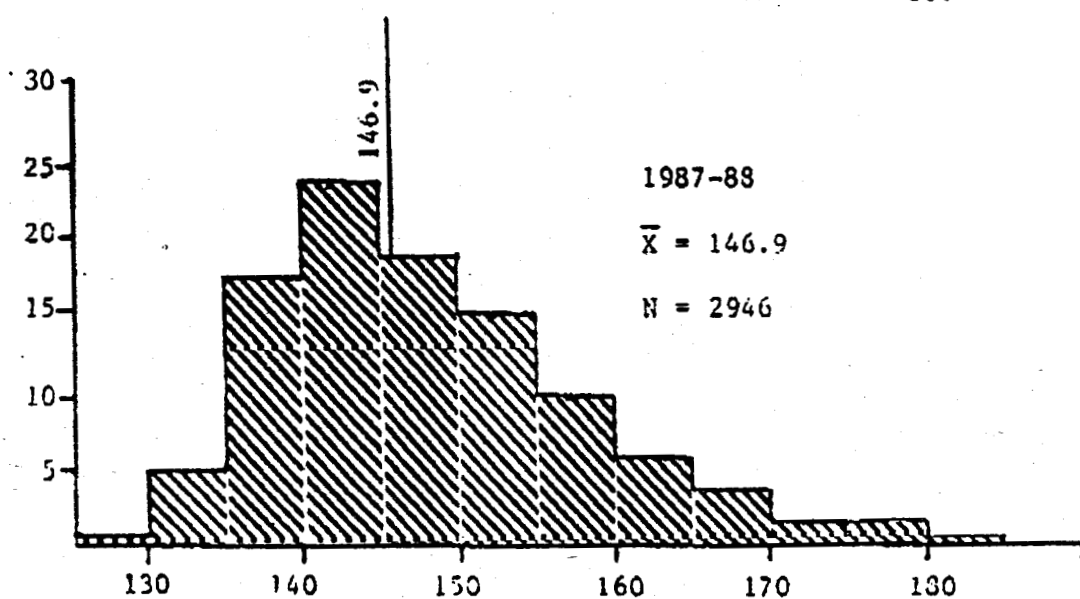
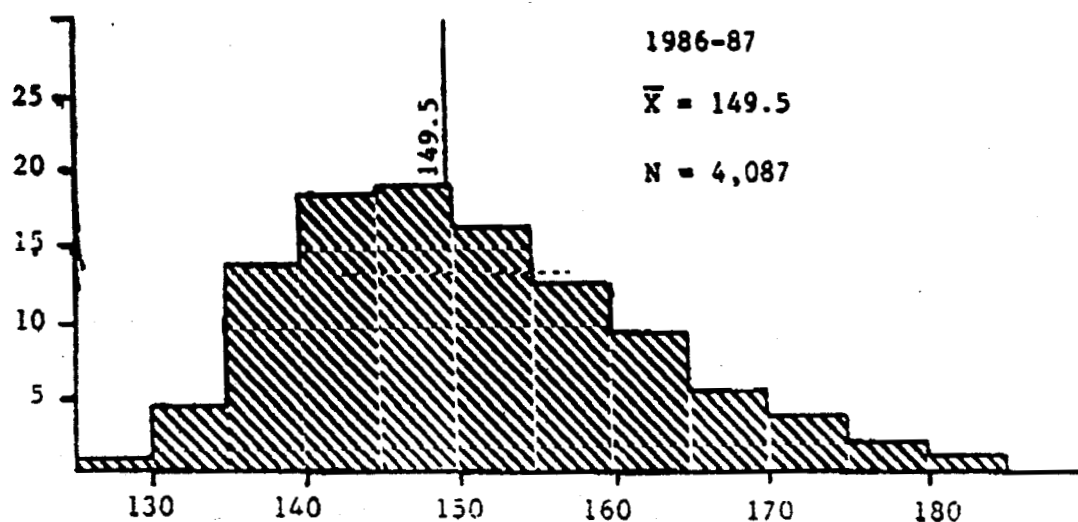


Figure 1. (con't. pg. 4) Adak king crab registration Area "D"



Average length in millimeters

Figure 2. Brown king crab length frequency from the Adak area.

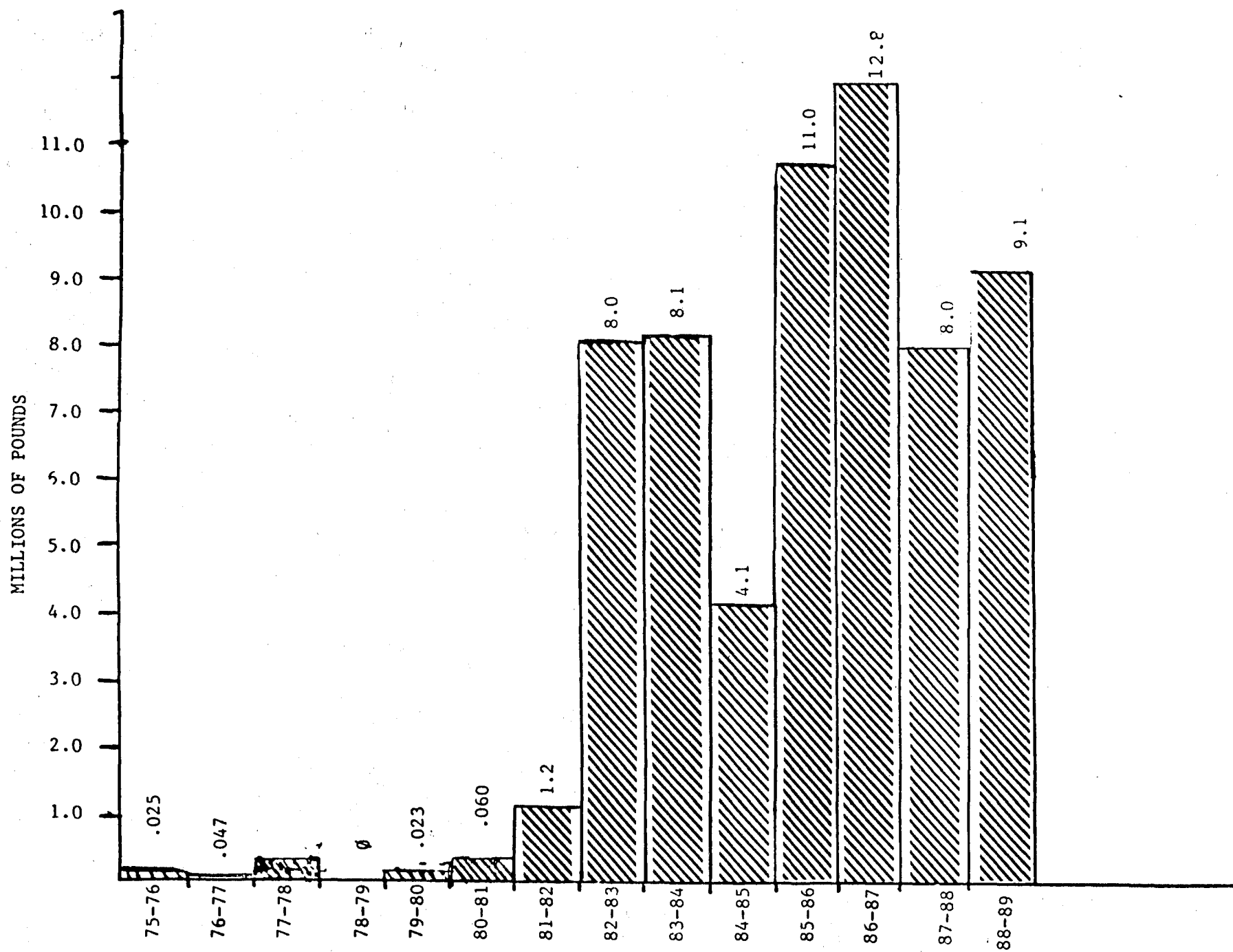


Figure 3. Adak brown king crab harvest by season.

ADAK RED KING CRAB

INTRODUCTION

Adak, Area 'R', is comprised of all continental shelf waters west of 171 W. longitude and east of the U.S./U.S.S.R. Convention Line.

HISTORICAL BACKGROUND

The Adak red king crab fishery began in 1961 when four vessels harvested two million pounds. As the fleet exploited the virgin populations, catches increased rapidly to a peak of 21 million pounds by the 1964/65 season. For a short time the expanding Dutch Harbor king crab fishery diverted effort, and Area 'R' catches dropped to 5.9 million pounds by the 1966/67 season.

From 1967/68 to the 1972/73 seasons, catches were relatively stable at 14-18 million pounds. The large catches were maintained by several years of very strong recruitment, and by the exploitation of populations discovered east of Adak Island. In addition to the eastward exploration, some vessels moved into the waters of the Petrel Banks, Amchitka Islands and other westward islands creating the separate Western Aleutians, Area 'S', fishery in 1967/68. The catch in Area 'S' was not large and in 1978 management was simplified by eliminating Area 'S' to form the Petrel Bank and Western Aleutian Districts of Area 'R'.

After the 1972/73 season, the harvest declined so sharply that the Board of Fisheries did not open the 1976/77 season. Catches made since 1976/77 have been extremely low compared to those of previous seasons, and any indications of recovery have been slight (Table 1, Figure 1). ADF&G research surveys conducted in 1975, 1976, and 1977 concluded that several years of poor recruitment were the

cause of the decline. A shell disease and unusually high natural mortality in the North Adak District was also blamed for the decreased populations.

In recent years, fleet effort increased because of high prices paid for red king crab and the growth of the Adak brown king crab fishery (Table 1). With the increased effort on brown king crab stocks, fewer vessels are concentrating on the less abundant red king crab. With the implementation of longlining pots for brown king crab and not for red king crab, gear type has separated effort for both species. In the past, before longlining, vessels were able to fish for both species with the same gear but on different grounds.

1989-90 FISHERY

The red king crab fishery opened on November 1 concurrent to brown king and Tanner crab fisheries in the area. Tank inspections and registrations were given in Dutch Harbor to 77 vessels, of which 27 indicated they intended to target only on red king crab.

As in past years, during November, the area around Semisopochnoi Island and the Petrel Banks produced the majority of the catch, 58% or over 610,000 pounds, (Tables 4 and 6). During the 1988/89 season, this same area produced only one third of the season's catch, 552,000 pounds. Other areas on the north and south sides of Atka Pass that produced over 300,000 pounds last year, produced only 15,000 pounds of red king crab for the 1989/90 season, (Tables 5 and 6). With high expectations by the fleet of easy catches which did not develop, the red king crab vessels began to return to Dutch Harbor as early as late November. Catches for December were only 92,000 pounds compared to over 268,000 pounds for the 1988/89 season, which closed in early December.

Preliminary totals for the Adak red king crab season through December indicate a catch of 1.1 million pounds, (Table 4). Small

effort has returned to the fishery in January and there have been no reported landings during the month at the time of this writing. The fishery closed by regulation February 15 with a projected harvest of 1.2 million pounds.

STOCK STATUS

The Adak red king crab stocks have not been surveyed since 1977, but the Mandatory Observer Program has produced 100% coverage on the fishing grounds and will produce valuable information on the fishery. The stocks seem stable, but depressed in comparison to historical catches of the early 1970's, (Table 1).

Table 1. Adak, Area 'R', historic red king crab catch.¹

Season	Vssls.	Lndgs.	No. Crab ²	No. Pounds ²	Pots Lifted	CPUE	Avg. Wt.	Percent Recruits	Avg. Length	Min. Size	Pounds Deadloss
1960/61	4	41	N/A	2,074,000	N/A	8.8	N/A	N/A	N/A	-	N/A
1961/62	8	218	N/A	6,114,000	N/A	N/A	N/A	N/A	N/A	-	N/A
1962/63	9	248	N/A	8,006,000	N/A	N/A	N/A	N/A	N/A	-	N/A
1963/64	11	527	N/A	17,904,000	N/A	N/A	N/A	N/A	N/A	-	N/A
1964/65	18	442	N/A	21,193,000	N/A	N/A	N/A	N/A	N/A	-	N/A
1965/66	10	431	N/A	12,915,000	N/A	N/A	N/A	N/A	N/A	6.5"	N/A
1966/67	10	90	N/A	5,883,000	N/A	N/A	N/A	N/A	N/A	6.5"	N/A
1967/68 ³	22	505	N/A	14,131,000	N/A	N/A	N/A	N/A	N/A	6.5"	N/A
1968/69	30		N/A	16,100,000	N/A	N/A	N/A	N/A	N/A	7 "	N/A
1969/70	33	435	N/A	18,016,000	115,929	N/A	6.5	N/A	N/A	7 "	N/A
1970/71	35	378	N/A	16,057,000	124,235	N/A	N/A	N/A	N/A	7 "	N/A
1971/72	40	166	N/A	15,475,924	46,011	N/A	N/A	N/A	N/A	6.5"	N/A
1972/73 ⁴	43	313	3,461,025	18,724,144	81,133	43	5.4	50.9	N/A	6.5"	N/A
1973/74	41	239	1,844,974	9,741,464	70,059	26	5.3	48.5	148.6	6.5"	N/A
1974/75	36	97	532,298	2,774,963	32,620	16	5.2	48.6	148.6	6.5"	N/A
1975/76	20	25	79,977	411,583	8,331	10	5.2	67.5	147.2	6.5"	N/A
1976/77			----- C L O S E D -----								
1977/78	12	18	160,343	905,527	7,269	22	5.7	43.9	152.2	6.5"	N/A
1978/79 ⁵	13	27	149,491	807,195	13,948	11	5.4	56.7	N/A	6.5"	1,170
1979/80	18	23	82,250	467,229	9,757	8	5.7	42.8	152.0	6.5"	24,850
1980/81	17	52	254,390	1,419,513	20,914	12	5.6	65.2	149.0	6.5"	54,360
1981/82	46	106	291,311	1,648,926	40,697	7	5.7	55.5	148.3	6.5"	8,759
1982/83	72	191	284,787	1,701,818	66,893	4	6.0	49.9	150.8	6.5"	7,855
1983/84	106	248	298,948	1,981,579	60,840	5	6.6	30.4	157.3	6.5"	3,833
1984/85	64	113	206,751	1,367,672	50,685	4	6.6	31.4	155.1	6.5"	0
1985/86	35	89	162,271	906,293	32,478	5	5.6	40.0	152.2	6.5"	6,120
1986/87	33	69	126,146	712,243	29,189	4	5.6	N/A	N/A	6.5"	500
1987/88	71	109	211,712	1,213,933	43,433	5	5.7	65.3	148.5	6.5"	6,900
1988/89	73	156	266,053	1,567,314	64,374	4	5.9	39.0	153.1	6.5"	557
1989/90 ⁶	51	109	193,124	1,099,145	53,597	4	5.7	N/A	N/A	6.5"	759

¹ Includes catch from former Area 'S' now Western Aleutians District 'R'² Includes deadloss³ Area 'S' fishery began⁴ Area 'S' continued until June⁵ Area 'S' eliminated - added to Area 'R'⁶ Preliminary figure

Table 2. Adak Area 'R' red king crab harvest composition by fishing season.¹

Season	Season		No. Pounds ²	Size Limit	Price Per Lb.
	Opened	Closed			
1960/61	01/01	12/31	2,074,000	-	N/A
1961/62	01/01	12/31	6,114,000	-	N/A
1962/63	01/01	12/31	8,006,000	-	N/A
1963/64	01/01	12/31	17,904,000	-	N/A
1964/65	01/01	12/31	21,193,000	-	N/A
1965/66	01/01	12/31	12,915,000	6.5"	N/A
1966/67	01/01	12/31	5,883,000	6.5"	N/A
1967/68 ³	01/01	12/31	14,131,000	6.5"	N/A
1968/69		03/15	16,100,000	7 "	N/A
1969/70	09/15	01/15	18,016,000	7 "	N/A
1970/71	11/01	03/31	16,057,000	7 "	N/A
1971/72	11/01	12/16	15,475,924	6.5"	N/A
1972/73 ⁴	11/01	02/17	18,724,144	6.5"	N/A
1973/74	11/01	02/26	9,741,464	6.5"	N/A
1974/75	01/10	03/05	2,774,963	6.5"	.35
1975/76	11/01	12/18	411,583	6.5"	.38
1976/77			- - - C L O S E D - - -		
1977/78	02/20	03/20	905,527	6.5"	1.36
1978/79 ⁵	02/21	03/29	807,195	6.5"	1.23
1979/80	01/15	04/01	467,229	6.5"	.68
1980/81	01/15	03/28	1,419,513	6.5"	.92
1981/82	11/01	02/15	1,648,926	6.5"	2.01
1982/83	11/01	01/15	1,701,818	6.5"	3.44
1983/84	11/10	12/16	1,981,579	6.5"	3.43
1984/85	11/10	02/15	1,367,672	6.5"	2.10
1985/86	11/01	02/15	906,293	6.5"	2.15
1986/87	11/01	02/15	712,243	6.5"	3.85
1987/88	11/01	02/15	1,213,933	6.5"	4.00
1988/89	11/01	12/04	1,567,314	6.5"	5.00
1989/90	11/01	01/15	1,099,145	6.5"	4.20

¹Includes catch from former Area 'S' now Western Aleutians District Area 'R'

²Includes deadloss

³Area 'S' fishery began

⁴Area 'S' continued until June

⁵Area 'S' eliminated -- added to Area 'R'

⁶Preliminary figures

Table 3. 1988/89 Adak, Area 'R', red king crab catch statistics by month.

Month	Vssls.	Lndgs.	No. Crab ¹	No. Pounds ¹	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
November	65	116	222,431	1,298,938	47,084	58.4	5	557
December	38	40	43,622	268,376	17,290	6.15	3	0
Season Total		156	266,053	1,567,314	64,374	5.89	4	557

¹ Deadloss included

Table 4. 1989/90 Adak, Area 'R', red king crab catch statistics by month.

Month	Vssls.	Lndgs.	No. Crab ¹	No. Pounds ¹	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
November	51	85	166,261	954,690	42,073	5.74	4	759
December	23	24	17,140	91,796	9,490	5.36	2	0
January	4	6	5,162	27,632	1,208	5.35	4	0
February		Confidential						
Season Total ²	51	120	193,124	1,099,145	53,597	5.69	4	759

¹ Deadloss included

² Preliminary figures

Table 5. 1989/90 Adak red king crab catch by statistical area.

Stat. Area	Lndgs.	No. Crab ¹	No. Pounds ¹	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
725201	5	4,484	24,072	892	5.37	5	0
735130	5	14,650	80,575	1,505	5.50	10	0
735201	10	11,376	70,786	6,137	6.22	2	0
745201	5	7,819	47,308	1,607	6.05	5	0
755132	12	17,659	118,177	5,036	6.69	3	0
755201	11	28,999	182,813	6,231	6.30	3	0
755205	8	9,540	60,544	2,590	6.35	4	0
765131	6	14,871	94,858	2,290	6.38	6	100
765132	6	6,316	44,180	2,215	6.99	3	0
765136	8	1,555	10,677	1,749	6.86	1	0
795200	4	11,999	63,868	1,641	-	-	0
805201	29	94,361	514,695	15,787	5.45	6	457
865233	4	5,428	29,041	1,788	5.35	3	0
All Others	43	36,996	225,720	14,906	6.10	3	0
Season Total	156	266,053	1,567,314	64,374	5.89	4	557

¹ Deadloss included

Table 6. Preliminary 1989/90 Adak red king crab catch by statistical area.

Stat. Area	Lndgs.	No. Crab ¹	No. Pounds ¹	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
725201	4	109	639	345	5.86	<1	0
735201	8	6,822	43,786	3,203	6.42	2	0
745131	5	1,167	8,229	1,183	7.05	1	7
745202	5	1,125	7,249	2,244	6.44	<1	0
755132	5	10,357	75,436	3,410	7.28	3	0
795200	15	42,905	232,220	5,860	5.41	7	22
805201	28	57,314	310,224	13,429	5.41	4	689
805202	4	12,285	68,352	2,860	5.56	4	41
All Others	34	51,090	299,171	18,995	5.85	3	0
Season Total ²	108	183,174	1,045,306	51,529	5.71	4	759

¹Deadloss included
²Preliminary figures

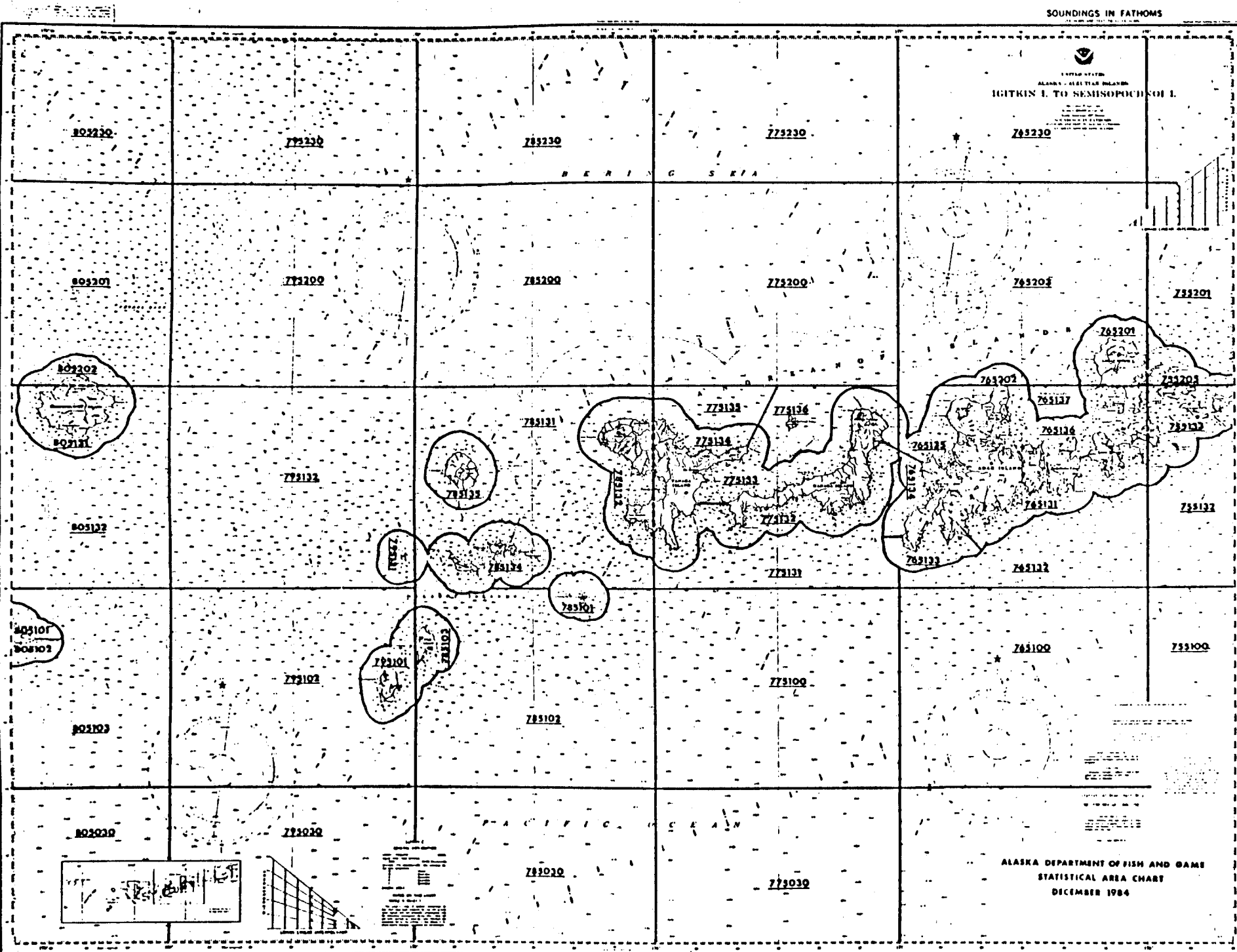
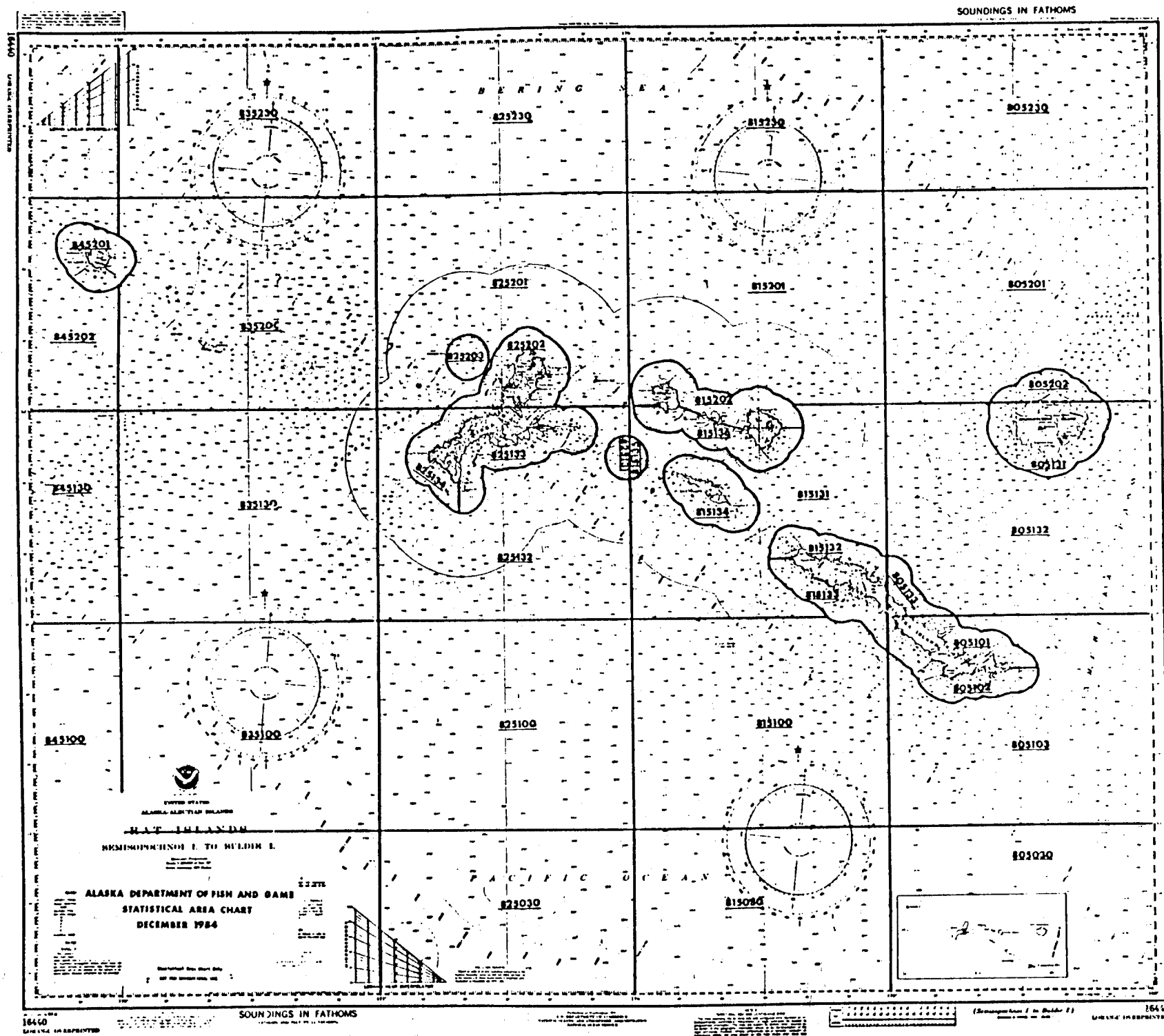
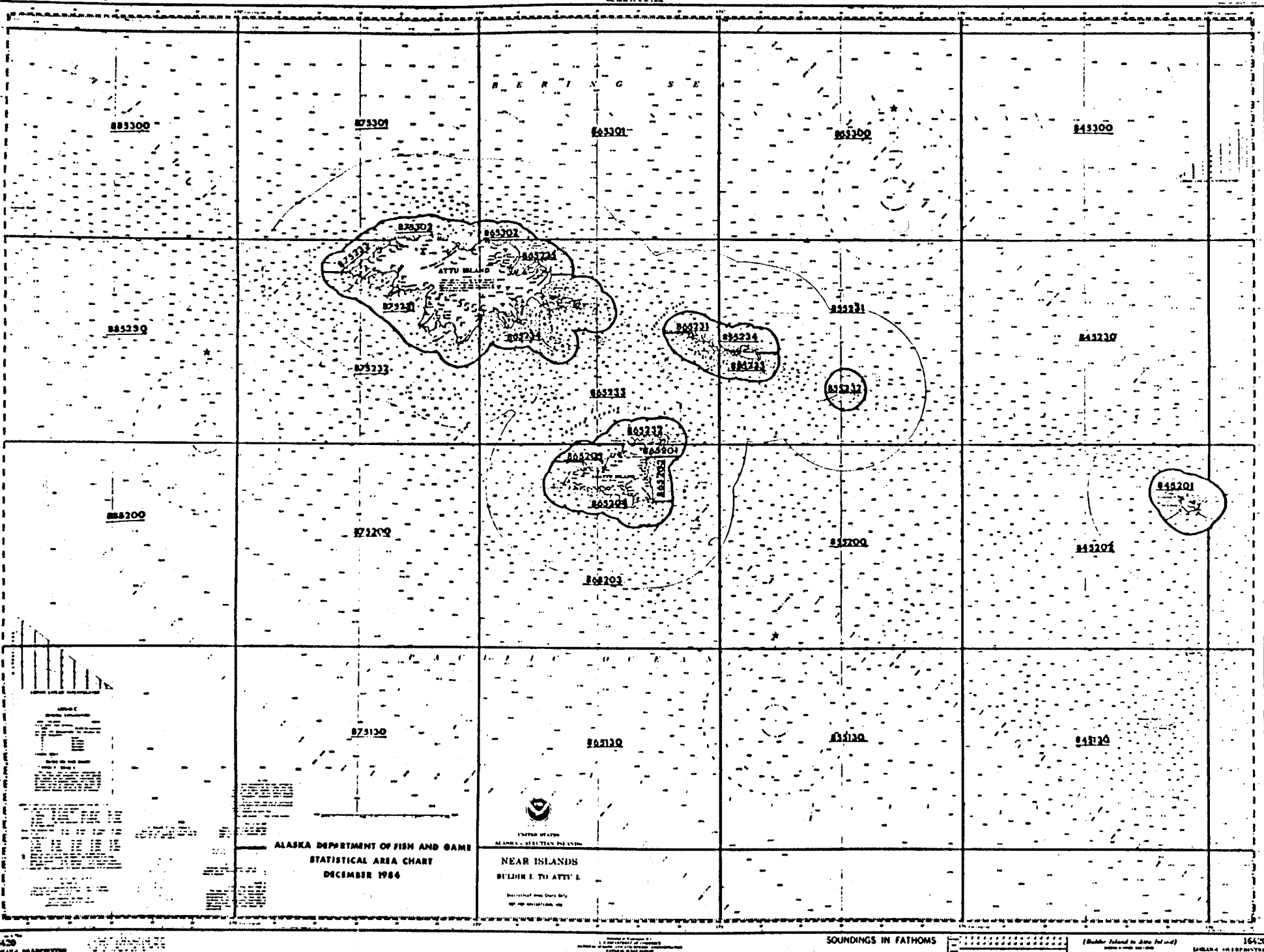


Figure 1. (con't pg. 2) Adak king crab registration Area "R".

Figure 1. Adak king crab registration Area 'R' (continued page 3).





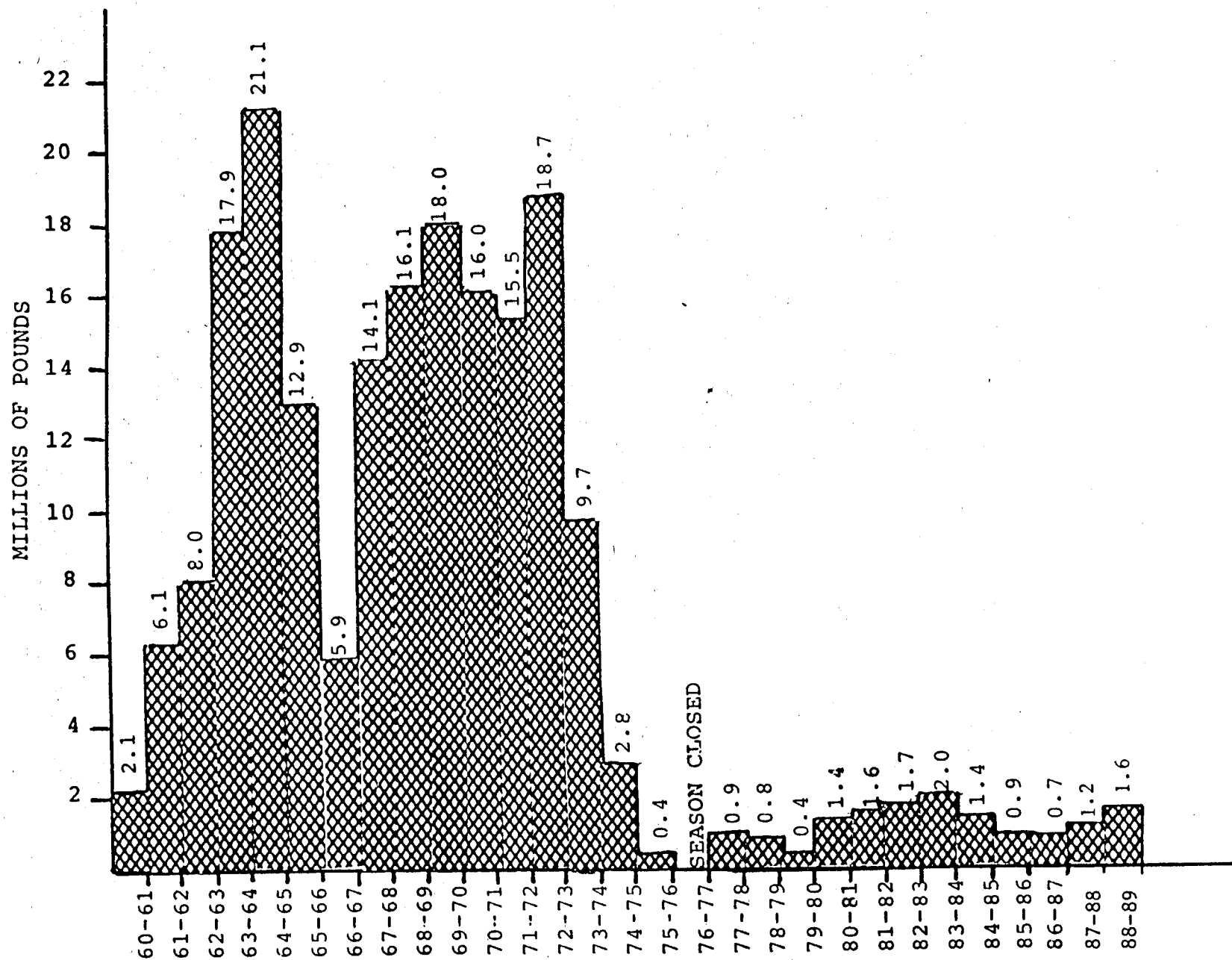


Figure 2. Adak red king crab harvest by season.

WESTERN ALEUTIAN TANNER CRAB

INTRODUCTION

The Western Aleutian District of Statistical Area 'J' includes all water west of 172° west longitude and south of 54° 36' north latitude.

HISTORICAL BACKGROUND

Tanner crab (*Chionoecetes bairdi*) from the Western Aleutian have generally been harvested in conjunction with the red king crab fishery in the area. Over the past ten years, the fishery has averaged over 297,000 pounds and ranged from a low of 42,700 during the 1986/87 season to a high of over 838,600 pounds taken during the 1981/82 fishery, (Table 1).

1989/90 FISHERY

The fishery opened concurrently with the red and brown king crab fisheries on November 1. Registrations and tank inspections were given to 32 vessels, including five local vessels working out of the Adak Naval Station.

Catches were incidental to the red king crab fishery and since mid-December when vessels left the fishery, there has been no reported catch other than those from local residents in Adak.

The catch to date is over 63,000 pounds and with the closure of red crab on February 15, only small catches from the Naval Station are expected.

Table 1. Historic Tanner crab fishery statistics from the Western Aleutians District.

Year	Opened	Closed	Vssls.	Lndgs.	No. Crab ¹	No. Pounds ¹	Pots Lifted	Avg. Wt.	CPUE	Min. Size	Avg. Price Pound
1973/74	11/01	10/15	7	12	31,079	71,887	2,390	2.3	13	.0	N/A
1974/75	11/01	10/15			Harvest confidential					.0	\$.12
1975/76	11/01	10/15			Harvest confidential					.0	\$.19
1976/77	11/01	10/15			- - - - - N O F I S H I N G - - - - -						
1977/78	11/01	06/15	6	7	103,190	237,512	2,700	2.3	38	5.5"	\$.38
1978/79	11/01	06/15	6	9	84,129	197,244	4,730	2.3	18	5.5"	\$.53
1979/80	11/01	06/15	10	12	147,843	337,297	5,952	2.3	25	5.5"	\$.52
1980/81	01/15	06/15	9	23	95,102	220,716	7,327	2.3	13	5.5"	\$.54
1981/82	01/15	06/15	17	43	364,164	838,697	21,910	2.3	17	5.5"	\$1.30
1982/83	11/01	06/15	61	125	225,491	488,399	40,450	2.2	6	5.5"	\$1.27
1983/84	11/10	06/15	31	86	171,576	384,146	20,739	2.2	8	5.5"	\$.95
1984/85	11/10	06/15	31	41	75,009	163,460	13,416	2.2	6	5.5"	\$1.30
1985/86	11/01	06/15	15	30	98,089	206,814	7,999	2.1	12	5.5"	\$1.40
1986/87	11/01	06/15	8	24	19,874	42,761	10,878	2.1	2	5.5"	\$1.50
1987/88	11/01	04/20	15	37	63,545	141,390	7,453	2.2	8	5.5"	\$2.10
1988/89	11/01	05/07	36	77	69,280	148,997	18,906	2.1	4	5.5"	\$1.00

¹ Deadloss included

Table 2. *Chionoecetes bairdi* catch by month for the Western Aleutian District, 1988/89 season.

Month	Vssls.	Lndgs.	No. Crab ¹	No. Pounds	Pots Lifted	Avg Wt.	CPUE	Pounds Deadloss
November	29	39	53,628	113,547	12,284	2.1	4	233
December	16	18	15,074	34,458	6,521	2.3	2	0
January	1	1		Confidential				
February	2	7		Confidential				
March	2	7		Confidential				
April	1	3		Confidential				
May	1	2		Confidential				
TOTAL	36	77	69,280	148,997	18,906	2.1	4	233

¹Deadloss included

Table 3. Preliminary *Chionoecetes bairdi* catch by month for the Western Aleutian District, 1989/90 season.

Month	Vssls.	Lndgs.	No. Crab ¹	No. Pounds	Pots Lifted	Avg Wt.	CPUE	Pounds Deadloss
November	10	14	20,767	43,841	5,283	2.3	4	3,560
December	5	6	1,979	4,537	945	2.3	2	250
Season Total ²	10	20	22,746	48,378	6,228	2.3	4	3,810

¹Deadloss included

²Season in progress

Table 4. *Chionoecetes bairdi* catch by statistical area for the Western Alutians District, 1988/89 season.

Stat Area	Lndgs	No. Crab	No. Lbs.	Pots Lifted	Avg Wt.	CPUE	Pounds Deadloss
735201	6	2590	5,717	2,778	2.2	1	0
745205	11	26190	54,264	3,617	2.1	7	0
765136	30	22,420	48,248	3,076	2.1	7	233
805201	5	4,688	11,232	2,231	2.4	2	0
ALL OTHERS	25	13,392	29,536	7,204	2.2	2	0
TOTAL	77	69,280	148,997	18,906	2.1	4	233

BERING SEA AREA
SHELLFISH MANAGEMENT REPORT
TO
ALASKA BOARD OF FISHERIES

MARCH 1990

BY

KENNETH L. GRIFFIN - AREA MANAGEMENT BIOLOGIST

Dutch Harbor Area Office

P. O. Box 308

Dutch Harbor, Alaska 99692

(907) 581-1239

BERING SEA DISTRICT TANNER CRAB

INTRODUCTION

The Bering Sea District of Statistical Area 'J' includes all waters of the Bering Sea north of the latitude of Cape Sarichef and east of the U.S. Russian Convention line of 1867. This District has two Subdistricts: the Western and Eastern, which includes the Norton Sound Section and the General Section (Figure 1). Two Tanner crab species, *Chionoecetes bairdi* and *Chionoecetes opilio*, are commercially harvested in the Bering Sea District.

HISTORIC BACKGROUND

The first reported Tanner crab catches were made in 1968 incidental to the king crab fishery. In 1974 a directed Tanner crab fishery began with the target species, *C. bairdi*. In the 1977/78 season, an incidental catch of *C. opilio* was reported. During the fall Board of Fisheries meeting in 1978, the National Marine Fisheries Service (NMFS) reported that as much as a 50 percent decline in *C. bairdi* stocks could be expected to occur during the 1978/79 fishing season, and the decline would continue for several years. As predicted, the *C. bairdi* stocks showed a sharp decline. Catches decreased from 29.7 million pounds during the 1981 fishery to 5.3 million pounds for the 1983 fishery to a total closure of the *C. bairdi* fishery in 1986 (Table 1, Figure 2). As the catches have declined in the *C. bairdi* fishery, effort has increased in the *C. opilio* fishery (Table 6, Figures 2 and 4).

Although prices have remained high for *C. bairdi*, fishing effort has decreased as the stock abundance decreased. With the decline in the *C. bairdi* stocks, which were primarily harvested from the Southeastern, now called the Eastern Subdistrict, industry and markets have turned to the smaller, more abundant, but less

valuable *C. opilio* stocks to fill demands for Tanner crab. Historic *C. bairdi* catch by subdistrict and season is depicted on Table 3. Figure 3 shows historic average size.

1989 C. BAIRDI FISHERY

The Bering Sea *C. bairdi* fishery opened concurrently with the *C. opilio* fishery on January 15, 1989. Although the preseason harvest projection indicated 13.5 million pounds of *C. bairdi* could be harvested, 7.9 million more than the 1988 season, only four vessels initially registered indicating that they would be targeting only the *C. bairdi* in the Eastern Subdistrict.

As in past seasons, the average catch per pot for *C. bairdi* is far less than that in the *C. opilio* fishery and the promise of large, fast deliveries in the *C. opilio* fishery caused the majority of the fleet to fish the Pribilof Islands Area. In addition to the fast paced *C. opilio* fishery in this area, some vessels fished gear closer to the Islands and targeted on the *C. bairdi* stocks in the Area. The catch from the area west of 165° West longitude accounted for over 3.5 million pounds of the total season harvest of 7.0 million pounds (Table 1).

During March, vessel effort increased from 44 vessels to 78 and the number of landings increased from 66 to 141, with the most increased catch and effort coming from the stocks around the Pribilof Islands, west of 165° West longitude (Tables 4 and 5).

On March 26, 1989 the Eastern Subdistrict was closed to *C. opilio* fishing. In addition, the Subdistrict was closed to the taking of *C. bairdi* west of 165° West longitude.

Fishing effort on the *C. bairdi* grounds north of Port Moller was small until the closure of the Pribilof Islands Area, when vessels

did not want to move to the Western Subdistrict to continue to fish for *C. opilio*. Some ice problems were encountered in the Bristol Bay Area during late March and early April, but vessels were able to move to the historic fishing grounds in April and caught over 2.7 million pounds from this area before it closed on May 7.

During the April fishery, in addition to mandatory observers, industry sponsored observers and Department samplers were placed onboard fishing vessels operating in the Area. By April 21, all had reported extremely high incidental catches of king crab in certain areas, most of which had not yet molted but soon would. From observations on the grounds, it was determined that for each legal male *C. bairdi* being caught, 2.8 male king crab and 1.5 female king crab and sublegal *C. bairdi* were being handled. The average catch per pot of *C. bairdi* during this time was 10 crabs and was declining. Based on the incidental handling of king crab and sublegal *C. bairdi*, vessel effort and declining catch per pot, the fishery was closed at noon May 7, 1989 (Table 2).

The total harvest for the Eastern Subdistrict was 7.0 million pounds. A total of 109 vessels landed *C. bairdi* from the Subdistrict, half of which came from west of 165° West longitude around the Pribilof Islands. The harvest of 7.0 million pounds was the best harvest in the Bering Sea since 1983 when 5.3 million pounds was harvested (Table 1). A total of five catcher/processors harvested *C. bairdi* during the 1989 season; all were covered by the mandatory observer program.

STOCK STATUS

The 1989 National Marine Fisheries Service Report To Industry, September 1989, stated, "Legal males were widely distributed in Bristol Bay and continental slope areas with regions of relatively high

abundance in mid Bristol Bay and the Pribilof Islands. The estimated abundance of legal male *C. bairdi* in the Eastern District is 33.6 million crabs".

"The estimated abundance of prerecruits increased significantly by 71 percent and the estimate of small males showed no significant change from 1988."

"The abundance of large females showed a slight but nonsignificant decrease, but the abundance of small females showed a significant increase of 77 percent from last year."

1989 C. OPILIO FISHERY

The *C. opilio* fishery opened on January 15, 1989 at 12:00 noon. In mid-November, a News Release announced the Westward Region Tanner crab quotas. The forecast for the Bering Sea *C. opilio* fishery was 131.9 million pounds, based on four inch or larger crab. The forecast was further broken down by subdistrict; 95.6 million pounds for the Eastern Area, and 36.4 million pounds for the Western Area.

Tank inspections and registrations were given to 118 vessels, 16 of which were catcher/processors. New regulations required mandatory observers on catcher/processors that fished *C. bairdi*, but not those that fished only *C. opilio*. Only one catcher/processor took an observer in January. Two floater processors were at the Pribilof Islands shortly after the season opened and others moved to the grounds in late January.

Fishing effort started as soon as the season opened and with a large population on the grounds as well as a large fishing and processing capacity, catches rapidly increased from 4.5 million pounds for the first week, to over 16 million pounds by the second week of February. Average catch per pot started out as high as 423 crabs, but as the fleet covered the entire Eastern Subdistrict population, catches gradually began to fall off and level out at around 250 crabs per pot. The largest week produced a catch of 16.4 million pounds, six million pounds more than the highest week during the 1988 fishery.

Unlike the 1988 season, the ice edge was not a major problem to the fleet, although a period of extreme cold did force some of the processors to leave the Pribilofs for a short time and vessels fishing north of the Islands did experience some gear loss to the advancing ice. By the end of February, over 66 million pounds had been harvested by the fleet of over 160 vessels (Table 9). With

a steady catch per pot of over 200 crabs and the fleet distributed throughout the *C. opilio* stocks in the Eastern Subdistrict, some vessels began to move into the Western Subdistrict as early as March (Table 9). With increased milder weather, the ice edge had retreated far enough north that the fleet was able to fish the western portion of the Western Subdistrict.

On March 15, with approximately 86 million pounds of *C. opilio* landed from the Eastern Subdistrict and a projected harvest of ten million pounds a week, the announcement to close the Area was made for March 26. After the announcement, catch, landings and average catch per pot rapidly declined as the fleet moved to the Western Subdistrict or over to the *C. bairdi* grounds off Port Moller. The Eastern Subdistrict produced a catch of 104.4 million pounds of *C. opilio*, with the crab averaging over 1.3 pounds each (Tables 9 and 10).

Some catches were reported from the Western Subdistrict in both January and February, but the major effort did not occur until the closure of the Eastern Subdistrict in late March (Table 9). Floater processors began moving to St. Matthew Island in mid-April, and by the end of the month eight were on the grounds.

Catches during April brought the Subdistrict's total to over 37 million pounds harvested by 127 vessels (Table 9). Average catch per pot was not as good as the Eastern Subdistrict, averaging around 140 crabs per pot. This can be attributed to the sorting of "dark shelled" crab in the Area, which are undesirable at present market conditions. This population of "dark shelled" crab continues to become a larger portion of the population in this area.

Some vessels experienced ice problems as they moved gear into the area west and north of St. Matthew Island. As the ice edge retreated and wind directions changed, some gear was moved as far

as thirty miles into Russian waters. Arrangements were made by industry and the Russians to retrieve this gear after the Area closed in May.

On April 27, with over 30 million pounds of *C. opilio* having been harvested from the Area, the decision to close the Subdistrict was announced for May 7. By this time vessel effort and average catch per pot had declined. The fishery had averaged over five million pounds per week.

The Subdistrict had a total harvest of over 45 million pounds taken by 127 vessels. The crab averaged 1.3 pounds each. The average catch per pot of 126 is less than the average for the 1988 season (Table 8).

The total *C. opilio* harvest for the Bering Sea was 149.4 million pounds valued at over \$112 million (Table 7). A total of 168 vessels participated in the fishery.

STOCK STATUS

As reported in the *National Marine Fishery Service's Report To Industry*, "The estimated number of large males is 187.1 million crabs, a slight increase from last year. Small males increased significantly by 75 percent and very large males decreased by ten percent. The estimated abundance of large female crabs showed a nonsignificant increase of 63 percent and small females showed a small increase of 56 percent."

Table 1. Historic Bering Sea *C. bairdi* catch statistics by season.

Year	Vessels	Landings	Crab ¹	Pounds ¹	Pots Lifted	CPUE	Avg. Wt.	Width(mm)	% New Shell	Pounds Deadloss
1968		7	6,400	17,900	1,400	5	2.8	-	-	NA
1969		131	353,300	1,008,900	29,800	12	2.9	-	-	NA
1970		66	482,300	1,014,700	16,400	29	2.1	-	-	NA
1971		22	61,300	166,100	7,300	8	2.7	-	-	NA
1972		14	42,061	107,761	4,260	10	2.6	-	-	NA
1973		44	93,595	231,668	15,730	6	2.5	-	-	NA
1974		69	2,531,825	5,044,197	22,014	115	2.0	-	-	NA
1975	28	80	2,773,770	7,284,378	38,462	72	2.5	-	-	NA
1976	66	305	8,949,886	22,341,475	141,179	63	2.5	-	-	NA
1976/77	83	541	20,251,508	51,455,221	297,171	68	2.5	-	-	NA
1977/78	120	861	26,350,688	66,648,954	516,350	51	2.5	152.8	88.0	218,099
1978/79	144	817	16,726,518	42,547,174	402,697	42	2.5	152.7	95.0	76,000
1979/80	152	804	14,685,611	36,614,315	488,434	30	2.5	151.4	90.0	56,446
1981	165	761	11,887,213	29,732,086	559,626	21	2.5	149.4	86.6	101,594
1982	125	791	4,830,980	11,008,779	490,099	10	2.3	148.8	85.4	138,159
1983	108	448	2,286,756	5,273,881	282,006	8	2.3	148.8	70.5	60,029
1984	41	134	516,877	1,208,223	61,357	8	2.3	146.5	40.0	5,025
1985	44	166	1,283,474	3,151,498	104,707	12	2.4	150.0	65.0	14,096
1986			S E A S O N C L O S E D							
1987			S E A S O N C L O S E D							
1988	98	248	987,059	2,210,394	112,334	8	2.5	143.5	70.2	10,724
1989	109	359	2,907,021	7,012,965	184,892	16	2.4	149.4	80.8	34,664

¹ Deadloss included

Table 2. Bering Sea *C. bairdi* Tanner crab seasons.

Season	Opened	Closed	Vessels	Pounds ¹	Avg. Wt.	CPUE	Price Pound
1968 ²			NA	17.9	2.8	5	NA
1969 ²			NA	1,008.9	2.9	12	NA
1970 ²			NA	1,410.7	2.1	29	NA
1971 ²			NA	166.1	2.7	8	NA
1972 ²			NA	199.2	2.8	6	NA
1973 ²			NA	301.9	2.3	8	NA
1974 ²			NA	5,044.2	2.0	115	NA
1974/75	7-29	6-15	28	7,028.4	2.5	72	\$.20
1975/76	8-1	7-15	66	22,358.1	2.5	63	.19
1976/77	8-1	7-7	83	51,455.2	2.5	68	.30
1977/78	9-15	6-15	120	66,430.9	2.5	51	.38
1978/79	11-1	5-24	144	42,547.2	2.5	42	.52
1979/80	11-1	5-11	157	36,614.3	2.5	30	.52
1981	1-15	4-15	165	29,630.5	2.5	21	.58
1982	2-15	6-15	125	11,008.8	2.3	10	1.06
							1.60
1983 ³	2-15	5-22	108	5,273.9	2.3	8	1.20
		6-15					
1984	2-15	6-15	41	1,208.2	2.3	8	.95
1985	1-15	6-15	38	3,151.5	2.4	12	1.40
1986		S E A S O N	C L O S E D				
1987		S E A S O N	C L O S E D				
1988	1-15	4-20	98	2,210.4	2.5	8	2.17
1989	1-15	5-7	109	7,012.9	2.4	16	2.90

¹ Figures given in thousands - deadloss included

² Incidental to the king crab fishery

³ Partial Bering Sea closure

Table 3. Historic Bering Sea *C. bairdi* catch by season by subdistrict.

Season	Subdistrict	Vssls.	Lndgs.	No. Crab ¹	No. Pounds ¹	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
1974/75	Southeastern Pribilofs		72	2,526,687	6,504,984	32,275	2.6	78	0
			8	247,083	523,394	3,923	2.1	63	0
	TOTAL	28	80	2,773,770	7,028,378	38,462	2.5	72	NR
1975/76	Southeastern Pribilofs		230	6,682,232	16,643,194	106,445	2.5	63	0
			74	2,273,804	5,714,913	34,761	2.5	65	0
	TOTAL	66	304	8,856,036	22,358,107	141,206	2.5	63	NR
1976/77	Southeastern Pribilofs		437	16,089,057	41,007,736	233,667	2.6	69	0
			104	4,162,451	10,447,485	63,804	2.5	65	0
	TOTAL	83	541	20,251,508	51,455,221	297,471	2.5	68	NR
1977/78	Southeastern Pribilofs		706	21,055,527	53,278,012	408,437	2.5	52	0
			155	5,210,170	13,152,843	107,913	2.5	48	0
	TOTAL	120	861	26,350,688	66,648,954	516,350	2.5	51	218,099
1978/79	Southeastern Pribilofs		758	15,601,891	39,694,205	356,594	2.5	44	75,400
			59	1,124,627	2,852,969	46,103	2.5	24	600
	TOTAL	144	817	16,726,518	42,547,174	402,697	2.5	42	76,0000

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Table 3. Historic Bering Sea *C. bairdi* catch by season by subdistrict (continued).

Season	Subdistrict	Vssls.	Lndgs.	No. Crab ¹	No. Pounds ¹	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
1979/80	Southeastern Pribilofs		789	14,329,889	35,724,003	476,410	2.5	30	56,446
			15	355,722	890,312	12,024	2.5	30	0
	TOTAL	152	804	14,685,611	36,614,315	488,434	2.5	30	56,446
1980/81	Southeastern Pribilofs		674	10,532,007	26,684,956	496,751	2.5	21	97,398
			87	1,313,951	2,945,536	62,875	2.5	21	4,196
	TOTAL	165	761	11,845,958	29,630,492	599,626	2.5	21	101,594
1981/82	Southeastern Pribilofs		539	3,825,433	8,812,302	322,634	2.3	12	69,829
			252	1,005,547	2,196,477	167,465	2.2	6	68,330
	TOTAL	125	791	4,830,980	11,008,779	490,099	2.3	10	138,159
1982/83	Northern		10	29,478	48,454	5,950	1.7	5	167
	Southeastern		287	1,984,673	4,633,354	192,538	2.3	10	52,879
	Pribilofs		151	272,505	592,073	83,528	2.2	3	6,983
	TOTAL	108	448	2,286,756	5,273,881	282,006	2.3	8	60,029
1983/84	Southeastern Pribilofs		91	470,181	1,099,142	44,546	2.3	11	4,688
			43	46,759	109,081	16,811	2.3	3	337
	TOTAL	41	134	516,877	1,208,223	61,357	2.3	8	5,025

continued....

Table 3. Historic Bering Sea *C. bairdi* catch by season by subdistrict (continued).

Season	Subdistrict	Vssls.	Lndgs.	No. Crab ¹	No. Pounds ¹	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
1985	Southeastern	38	143	1,278,109	3,139,041	96,976	2.4	13	14,096
	Pribilofs	15	23	5,365	12,457	7,731	2.3	1	0
	TOTAL	44	166	1,283,474	3,151,498	104,707	2.4	12	14,096
1986	SEASON CLOSED	-	-	-	-	-	-	-	-
1987	SEASON CLOSED	-	-	-	-	-	-	-	-
1988	Eastern	98	248	897,059	2,210,394	112,334	2.5	8	10,724
	Western			NO CATCH REPORTED					
	TOTAL	98	248	897,059	2,210,394	112,334	2.5	8	10,724
1989	Eastern	109	359	2,907,021	7,012,965	184,892	2.4	16	34,664
	Western			NO CATCH REPORTED					
	TOTAL	109	359	2,907,021	7,012,965	184,892	2.4	16	34,664

¹ Deadloss included

Table 4. 1989 season *C. bairdi* catch by month for the Eastern Bering Sea.

Month	Vessels	Landings	Crab ¹	Pounds ¹	Pots Lifted	Avg. Wt.	CPUE	Deadloss
Jan	20	20	91,077	213,428	6,778	2.3	13	200
Feb	44	66	637,993	1,537,859	25,472	2.4	25	21,950
Mar	78	141	1,043,511	2,475,112	66,116	2.4	16	5,150
Apr	55	86	738,195	1,822,423	56,606	2.5	13	5,164
May	46	46	296,245	964,143	29,920	2.4	13	2,200
TOTAL	109	359	2,907,021	7,012,965	184,892	2.4	16	34,664

Table 5. 1989 *C. bairdi* catch, by statistical area, for the Bering Sea.

Area	Landings	Crab ¹	Pounds ¹	Pots Lifted	Avg. Wt.	CPUE	Deadloss
605630	4	18,127	40,455	1,320	2.23	14	100
605700	3	36,099	86,979	2,354	2.40	15	0
615601	8	77,828	196,718	7,503	2.52	10	0
615630	31	185,763	447,774	18,136	2.41	10	1,400
615700	6	68,668	171,921	6,532	2.50	10	0
625600	20	185,378	479,499	10,833	2.59	17	1,364
625630	11	69,163	164,548	6,102	2.38	11	0
635530	4	30,686	75,293	1,795	2.45	17	200
635600	34	399,485	990,523	26,354	2.48	15	3,500
635630	5	30,572	73,771	3,123	2.41	10	0
645501	7	39,295	94,663	2,249	2.40	17	200
645600	5	24,950	59,840	2,156	2.39	11	600
685600	18	52,363	120,949	6,637	2.30	8	0
685630	45	268,679	638,891	15,453	2.37	17	1,134
695631	25	493,977	1,194,622	14,650	2.42	34	21,783
695632	7	45,481	112,557	4,682	2.47	10	0
695700	4	99,338	224,219	2,375	2.25	42	0
705600	4	23,461	54,228	2,580	2.31	9	0
705630	31	311,078	731,371	11,867	2.35	26	1,533
705701	18	193,816	464,708	10,236	2.40	19	500
715630	10	5,360	12,942	3,810	2.41	1	0
715700	19	87,258	204,619	6,806	2.34	13	150
715730	7	8,404	20,170	3,063	2.40	3	500
725700	4	1,906	4,453	2,425	2.33	1	0
OTHER	29	149,886	347,252	11,851	2.32	13	1,700
TOTAL	359	2,907,021	7,012,965	184,892	2.41	16	34,664

¹ Deadloss included

Table 6. Historic Bering Sea *C. opilio* catch statistics by season.

Year	Vssls.	Lndgs.	No. Crab ¹	No. Pounds ¹	Pots Lifted	CPUE	% New Shell ²	Avg. Wt.	Average Width (mm) ²	Pounds Deadloss
1977/78	15	38	1,267,546	1,716,124	13,247	96	NA	1.4	NA	0
1978/79	102	490	22,118,498	32,187,039	190,746	115	83.0	1.5	113.1	759,173
1979/80	134	597	25,286,777	39,572,668	255,022	95	90.0	1.6	118.1	228,345
1981	153	867	34,415,322	52,750,034	435,742	79	79.2	1.5	117.0	2,269,979
1982	122	803	24,089,562	29,355,379	469,091	51	78.0	1.2	109.4	1,042,655
1983	109	462	23,838,149	26,128,410	287,127	83	NA	1.1	NA	1,324,466
1984 ³	52	367	21,009,935	26,813,074	173,591	138	78.0	1.1	105.4	798,744
1985 ⁴	75	718	52,903,246	65,998,875	372,045	120	80.0	1.3	108.0	1,064,184
1986 ⁵	88	992	76,499,123	97,984,539	543,744	141	73.7	1.3	109.5	1,392,933
1987	103	1,038	81,307,659	101,903,388	616,113	132	84.0	1.2	108.9	978,449
1988	171	1,285	105,716,337	134,060,185	766,907	137	71.2 ⁶	1.3	109.5	3,260,020
1989	168	1,341	112,618,881	149,455,848	663,442	178	85.2 ⁶	1.3	111.2	1,844,682

¹ Deadloss included

² Southeast and Pribilof Districts only

³ North of 58° reopened until 12-31

⁴ West of 164° opened through 12-31

⁵ Open only west of 164° W. longitude

⁶ Eastern and Western Districts combined

Table 7. Bering Sea *C. opilio* Tanner crab seasons data.

Season	Opened	Closed	Vssls.	Pounds ¹	Avg. Wt.	CPUE	Price Per Pound
1977/78	09-15-77	09-23-78	13	1,716,124	1.4	96	\$.38
1978/79	11-01-78	09-03-79	134	32,187,039	1.5	115	.30
1979/80	11-01-79	08-15-80 09-03-80 ²	152	39,572,668	1.6	99	.21
1981	01-15-81	08-01-81 09-01-81 ²	153	52,750,034	1.5	76	.26
1982	02-15-82	08-01-82	122	29,355,374	1.2	51	.73
1983	02-15-83	05-22-83 06-15-83 ³	109	26,128,410	1.1	83	.35 ²
1984	02-15-84 08-01-84	08-01-84 12-31-84 ⁴	52	23,940,984 2,872,090	1.1 1.1	147 125	.30
1985	01-15-85 10-09-85	09-22-85 12-31-85 ⁵	75	57,446,554 8,552,321	1.2	142	.30
1986	01-15-86	09-24-86 ⁶	88	97,984,539	1.3	141	.60
1987	01-15-86	06-22-87	103	101,903,388	1.2	132	1.75
1988	01-15-88 05-15-88	03-29-88 06-30-88	161 <u>156</u> 171	75,695,562 <u>59,659,075</u> 135,354,637	1.3 1.3 1.3	141 <u>146</u> 144	.75 <u>.80</u> .77
1989	01-15-89	05-07-89	168	149,455,848	1.3	178	.75

¹ Deadloss included

² Varied according to size

³ Partial Bering Sea closure

⁴ North of 58° only

⁵ West of 164° opened through 12-31-85

⁶ Open only west of 164° W. longitude

Table 8. Historic Bering Sea *C. opilio* catch, by season, by subdistrict.

Season	Subdistrict	Vssls.	Lndgs.	No. Crab ¹	No. Pounds ¹	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
1977/78	Southeastern Pribilof		33	1,063,872	1,439,959	11,560	1.4	0	0
			5	203,674	276,165	1,687	1.4	121	0
	TOTAL	13	38	1,267,546	1,716,124	13,247	1.4	96	0
1978/79	Southeastern Pribilof	101	476	21,279,794	31,102,832	184,491	1.5	115	659,137
		10	14	838,704	1,084,039	6,225	1.5	134	100,000
	TOTAL	102	490	22,118,498	32,187,039	190,746	1.5	115	759,137
1979/80	Southeastern Pribilof	133	561	23,199,446	36,406,391	237,375	1.6	97	187,945
		19	36	2,087,331	3,166,777	17,727	1.5	116	40,400
	TOTAL	134	597	25,286,777	39,572,668	225,102	1.6	99	228,345
1980	Southeastern Pribilof		624	24,498,642	37,866,229	309,304	1.6	76	1,475,078
			243	9,916,617	14,886,705	126,438	1.5	74	794,901
	TOTAL	153	867	34,415,322	52,753,034	435,742	1.5	76	2,269,979
1982	Southeastern Pribilof		468	10,207,174	13,079,583	257,193	1.3	40	422,979
			335	13,882,388	16,276,421	211,898	1.2	65	
	TOTAL	122	803	24,089,562	29,355,374	469,091	1.2	51	1,092,655

Table 8. Historic Bering Sea *C. opilio* catch, by season, by subdistrict (continued).

Season	Subdistrict	Vssls.	Lndgs.	No. Crab ¹	No. Pounds ¹	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
1983	Southeastern		153	3,553,281	94,197,304	4,470	1.2	38	165,298
	Pribilof		239	19,076,553	20,514,000	153,458	1.0	124	1,078,643
	Northern		69	1,223,813	1,417,106	39,199	1.1	31	80,525
	TOTAL	109	461	23,853,647	26,128,410	287,127	1.1	83	1,324,466
1984	Southeastern		76	3,534,370	3,990,621	33,091	1.1	106	54,678
	Pribilof		230	17,909,096	19,727,493	112,078	1.1	160	708,706
	Northern		61	2,566,469	3,094,960	28,422	1.2	91	35,411
	TOTAL	52	367	24,009,935	26,813,074	173,591	1.1	138	798,795
1985	Southeastern	55	301	21,963,882	27,373,232	158,819	1.4	95	461,001
	Pribilof	60	301	24,089,526	29,804,093	142,937	1.2	168	505,146
	Northern	24	116	6,849,838	8,821,550	70,289	1.3	97	98,037
	TOTAL	139	718	52,903,246	65,998,875	372,045	1.3	120	1,064,184
1986	Southeastern	47	112	8,491,694	10,957,578	63,889	1.3	132	44,755
	Pribilof	80	508	39,851,767	50,525,150	281,337	1.3	142	472,342
	Northern	67	372	28,155,662	36,501,811	198,518	1.3	142	861,436
	TOTAL	88	992	76,499,123	97,984,539	543,744	1.3	141	1,378,533

continued....

Table 8. Historic Bering Sea *C. opilio* catch, by season, by subdistrict (continued).

Season	Subdistrict	Vssls.	Lndgs.	No. Crab ¹	No. Pounds ¹	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
1987	Southeastern	28	64	4,116,778	5,106,473	24,619	1.2	167	24,619
	Pribilof	94	458	38,604,802	47,676,734	261,337	1.2	163	261,337
	Northern	99	516	38,586,079	49,120,181	330,157	1.2	117	330,157
	TOTAL	10	1,038	81,307,659	101,903,388	616,113	1.2	132	978,449
1988	Eastern	161	770	59,838,392	75,695,562	422,719	1.3	141	775,104
	Western	156	515	47,330,314	59,689,075	323,196	1.3	146	2,484,916
	TOTAL	117	1,283	107,168,706	135,354,637	745,915	1.3	144	3,260,020
1989	Eastern	163	871	77,698,698	104,399,693	391,451	1.3	198	1,128,971
	Western	127	470	34,920,183	45,056,155	271,991	1.3	126	715,711
	TOTAL	168	1,341	112,618,881	149,455,848	663,442	1.3	178	1,844,682

¹ Deadloss included

Table 9. 1989 season *C. opilio* catch by district and month for the Eastern Bering Sea.

Subdistrict	Vssls.	Lndgs.	No. Crab ¹	No. Pounds ¹	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
January								
Eastern	112	131	14,123,923	18,777,492	42,050	1.33	336	116,918
Western				Confidential				
Total	112		14,229,591	18,169,973	42,253	1.33	337	230,918
February								
Eastern	153	356	36,147,082	47,900,851	154,800	1.33	233	610,481
Western				Confidential				
Total	153		36,395,518	48,224,821	155,762	1.33	234	612,481
March								
Eastern	152	355	26,280,607	36,213,996	184,201	1.38	143	393,222
Western	49	73	5,855,993	7,578,262	37,903	1.39	154	39,512
Total	157	428	32,136,600	43,792,258	222,104	1.36	144	432,734
April								
Eastern	29	29	1,147,086	1,507,354	10,400	1.31	10	8,350
Western	119	276	22,688,500	29,112,610	168,931	1.28	134	272,119
Total	128	305	23,835,586	30,619,964	179,331			280,469

continued....

Table 9. 1989 season *C. opilio* catch by district and month for the Eastern Bering Sea (continued).

Subdistrict	Vssls.	Lndgs.	No. Crab ¹	No. Pounds ¹	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
May								
Western	103	117	6,021,586	7,901,832	63,992	1.31	94	288,080
Total	103	117	3,021,586	7,901,832	63,992	1.31	94	288,080
Subdistrict Total								
Eastern	163	871	77,698,698	104,399,693	391,451	1.34	198	1,128,971
Western	127	470	34,920,183	45,056,155	271,991	1.29	128	715,711
Season Total	168	1,341	112,618,881	149,455,848	663,442	1.33	178	1,844,682

Table 10. 1989 *C. opilio* catch, by statistical area, for the Bering Sea.

Area	Landings	Crab ¹	Pounds ¹	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
<u>EASTERN</u>							
675600	NA	299,892	378,851	2,251	1.26	133	0
685600	NA	2,036,724	2,582,311	12,116	1.27	168	46,110
685630	NA	1,898,449	2,438,649	13,699	1.28	138	47,394
685700	NA	125,522	195,893	941	1.56	133	31,700
695600	NA	89,858	116,180	1,683	1.29	53	2,000
695631	NA	211,497	283,784	7,391	1.34	29	2,208
695700	NA	126,178	164,958	1,963	1.30	64	350
705600	NA	2,192,054	2,884,687	11,939	1.31	183	13,590
705630	NA	6,072,731	8,223,885	29,855	1.35	203	89,933
705701	NA	767,964	1,027,432	5,164	1.33	149	41,125
715600	NA	476,969	632,897	2,490	1.32	189	8,200
715630	NA	18,572,376	25,783,025	74,317	1.38	250	372,664
715700	NA	17,215,084	22,960,755	79,456	1.33	217	206,231
715730	NA	3,553,674	4,688,244	20,673	1.31	172	38,842
725630	NA	8,221,673	10,899,149	34,801	1.32	236	101,174
725700	NA	8,228,868	11,038,382	41,229	1.34	199	67,884
725730	NA	4,440,876	5,907,761	28,231	1.33	157	20,993
725800	NA	2,388,683	3,178,327	16,690	1.33	143	18,740
OTHER	NA	779,626	1,014,523	6,562	1.30	118	23,666
TOTAL	871	77,698,698	104,399,693	391,451	1.34	198	1,128,971
<u>WESTERN</u>							
735700	NA	674,167	895,527	3,129	1.33	215	116,200
735730	NA	3,129,584	4,112,188	23,633	1.31	132	21,950
735800	NA	4,041,805	5,118,105	33,832	1.26	118	64,150
735830	NA	385,898	489,853	4,217	1.26	91	0
735930	NA	222,095	290,977	2,004	1.31	111	2,772
745900	NA	293,970	381,499	3,273	1.29	89	1,000
745930	NA	645,645	824,142	4,243	1.27	152	1,500

continued....

Table 10. 1989 *C. opilio* catch, by statistical area, for the Bering Sea (continued).

Area	Landings	Crab ¹	Pounds ¹	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
755900	NA	3,869,750	4,914,140	27,243	1.26	142	55,400
755930	NA	4,675,181	6,068,324	32,582	1.29	143	221,906
756000	NA	1,170,489	1,495,265	8,869	1.27	132	18,000
756030	NA	153,662	194,363	1,720	1.26	89	0
765900	NA	522,184	648,121	6,250	1.24	83	15,000
765930	NA	1,473,071	1,866,470	11,533	1.26	128	13,150
766000	NA	2,984,312	3,735,836	20,985	1.25	142	4,050
766030	NA	541,122	702,319	4,953	1.29	109	4,100
775930	NA	351,452	469,910	2,270	1.33	155	2,400
776000	NA	4,461,824	5,827,324	32,184	1.30	139	41,750
776030	NA	1,792,152	2,330,492	16,212	1.30	110	95,703
776100	NA	373,544	573,095	4,874	1.53	76	11,180
786030	NA	718,514	960,829	5,171	1.33	139	3,500
786100	NA	1,184,036	1,540,371	10,803	1.30	110	6,000
OTHERS	NA	1,255,726	1,617,005	12,011	1.29	104	16,000
TOTAL		34,920,183	45,056,155	271,991	1.29	128	715,711
SEASON TOTAL		112,618,881	149,455,848	663,442	1.30	178	1,844,682

¹ Deadloss included

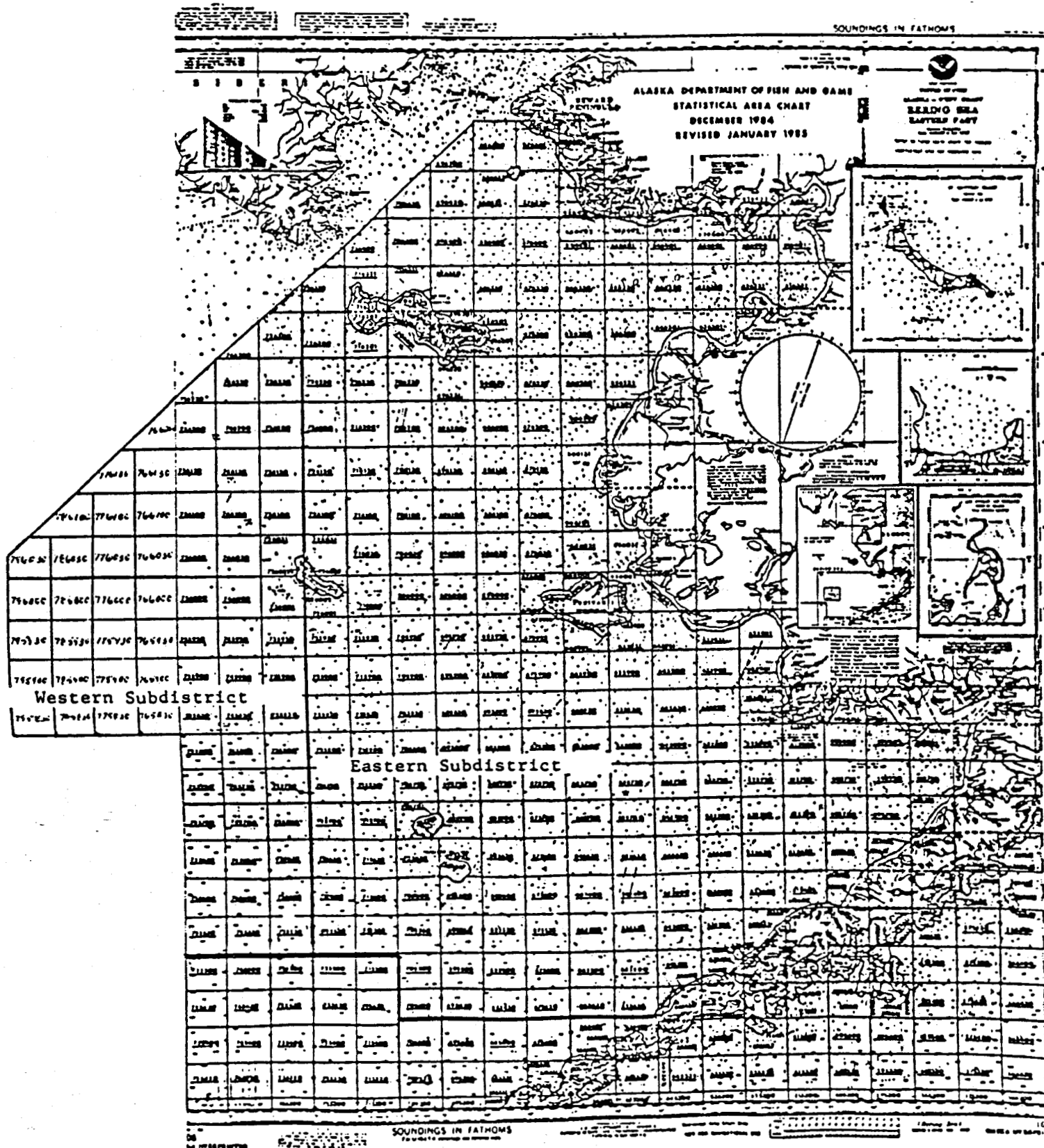


Figure 1. Bering Sea District of Statistical Area "J".

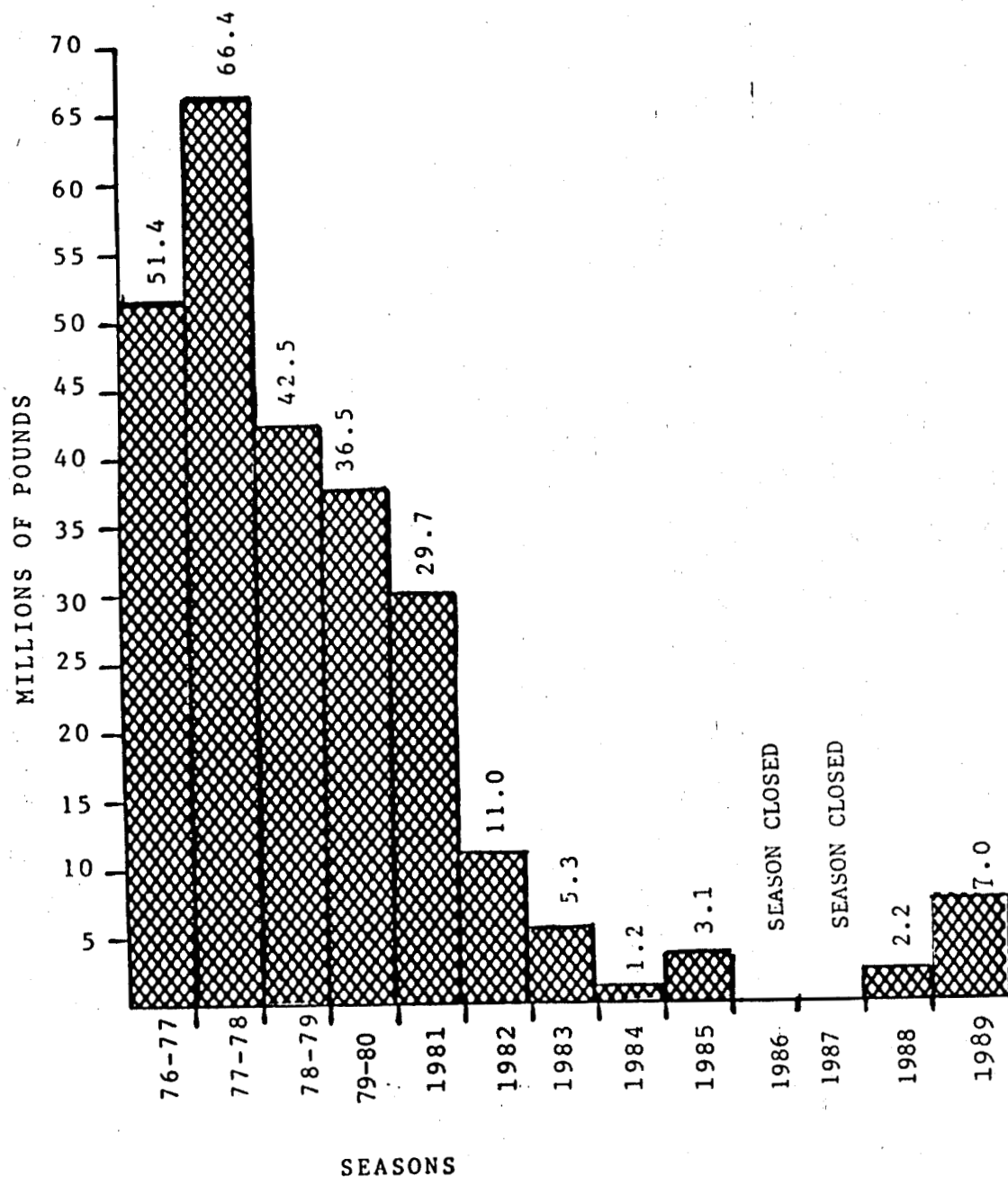


Figure 2. Historic Bering Sea *C. bairdi* Catch By Season.

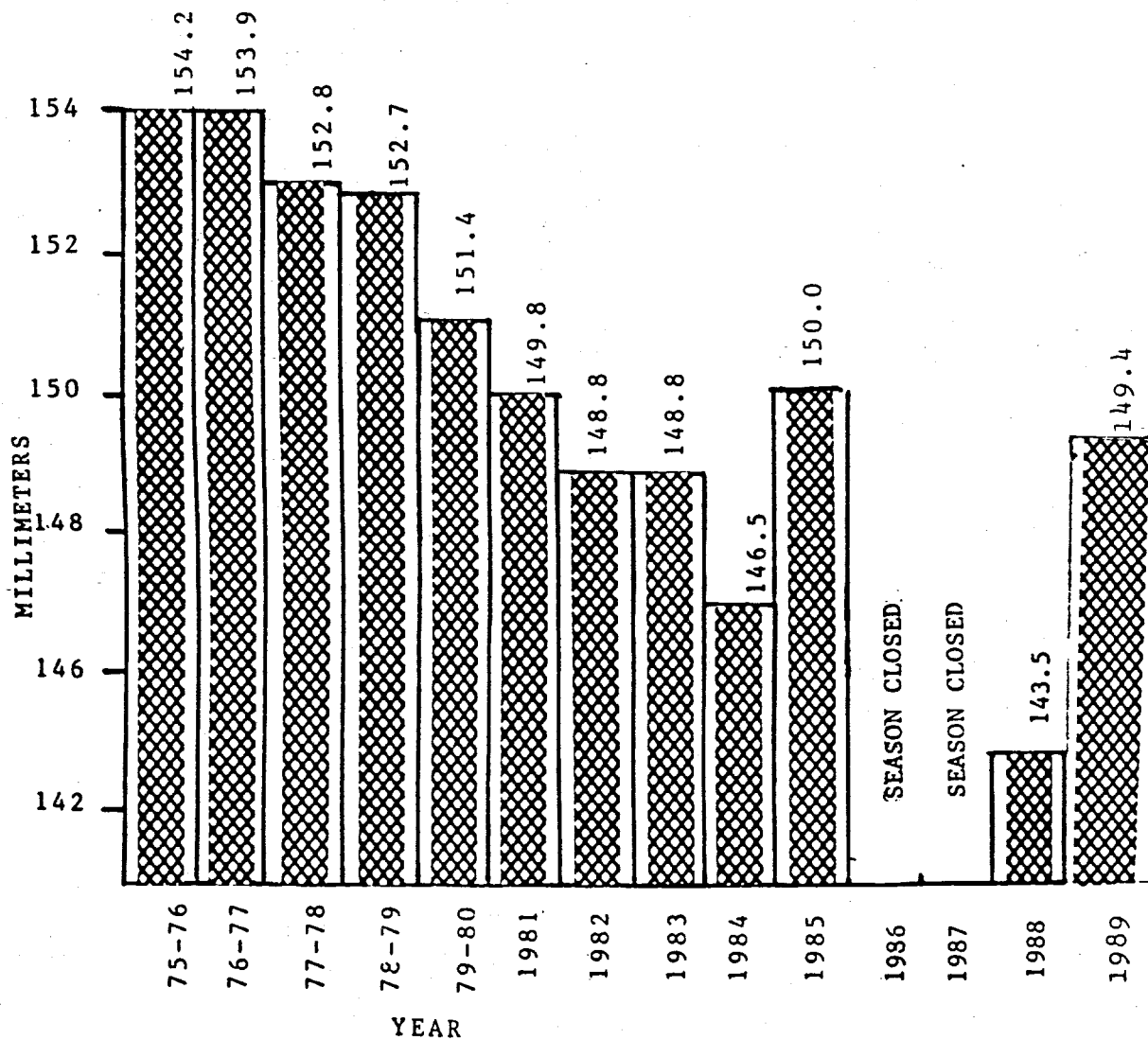


Figure 3. Historic C. bairdi Average Width
Frequencies for the Bering Sea District.

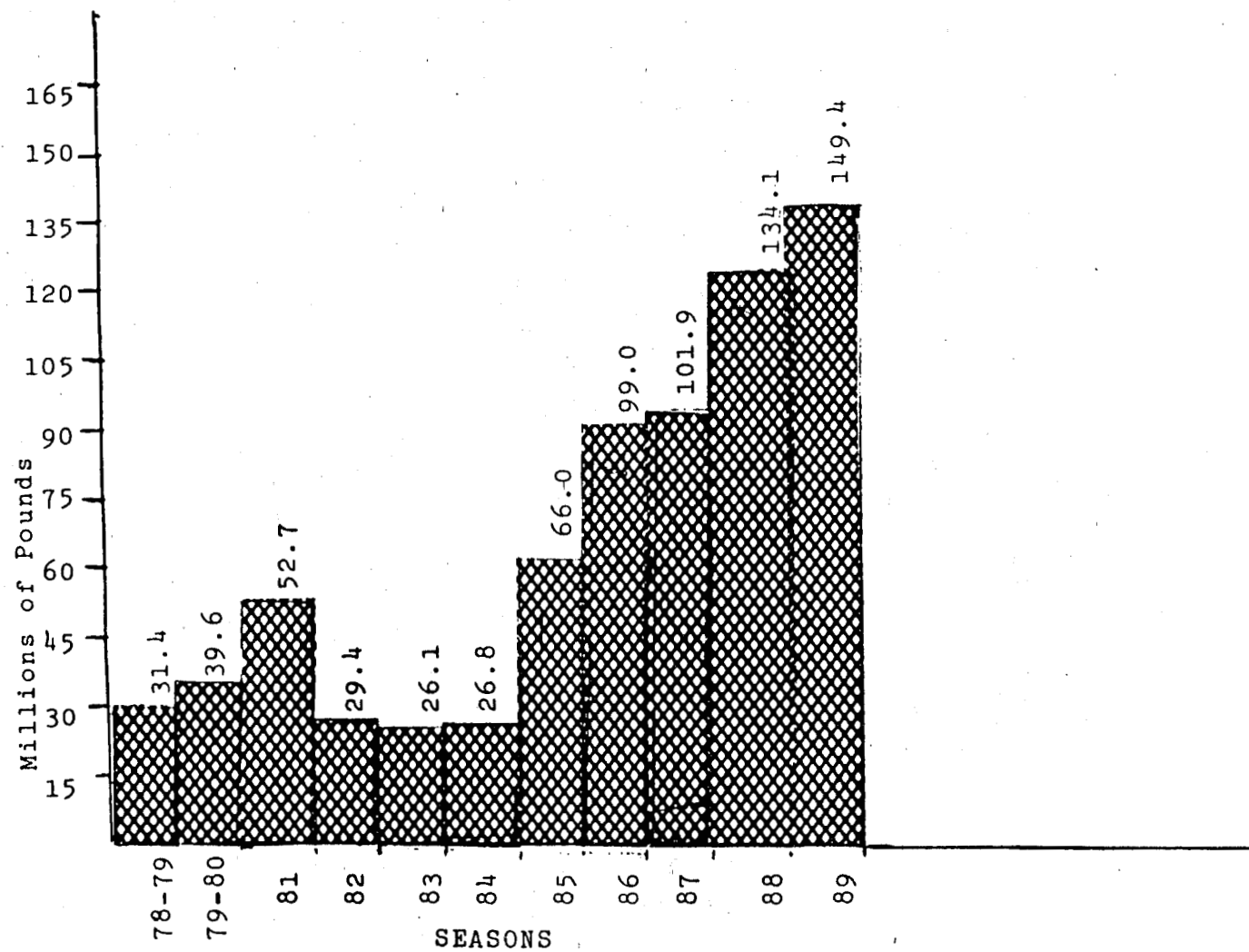


Figure 4. Historic Bering Sea C. opilio catch, by season.

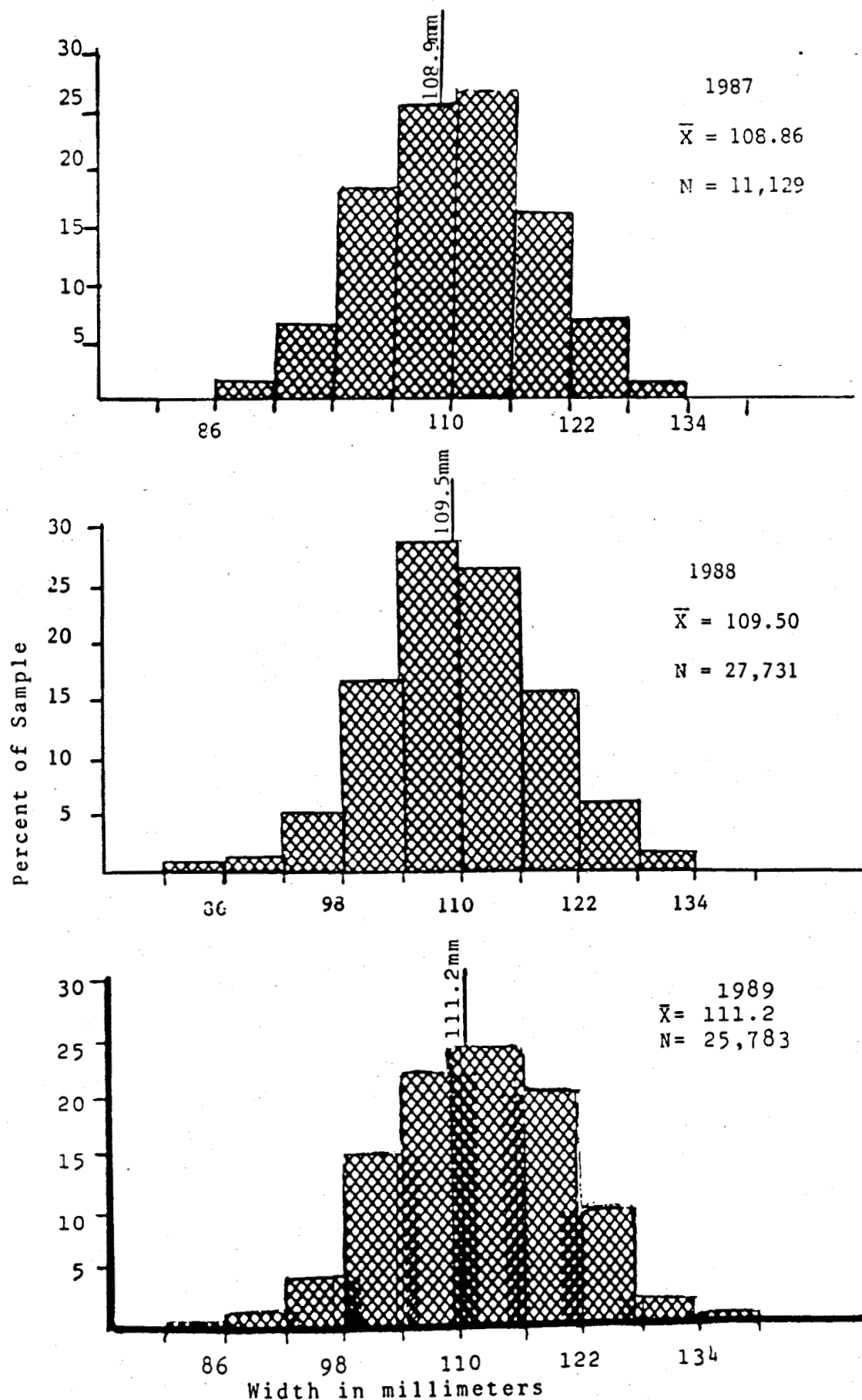


Figure 5. Bering Sea *C. opilio* width frequency distribution.

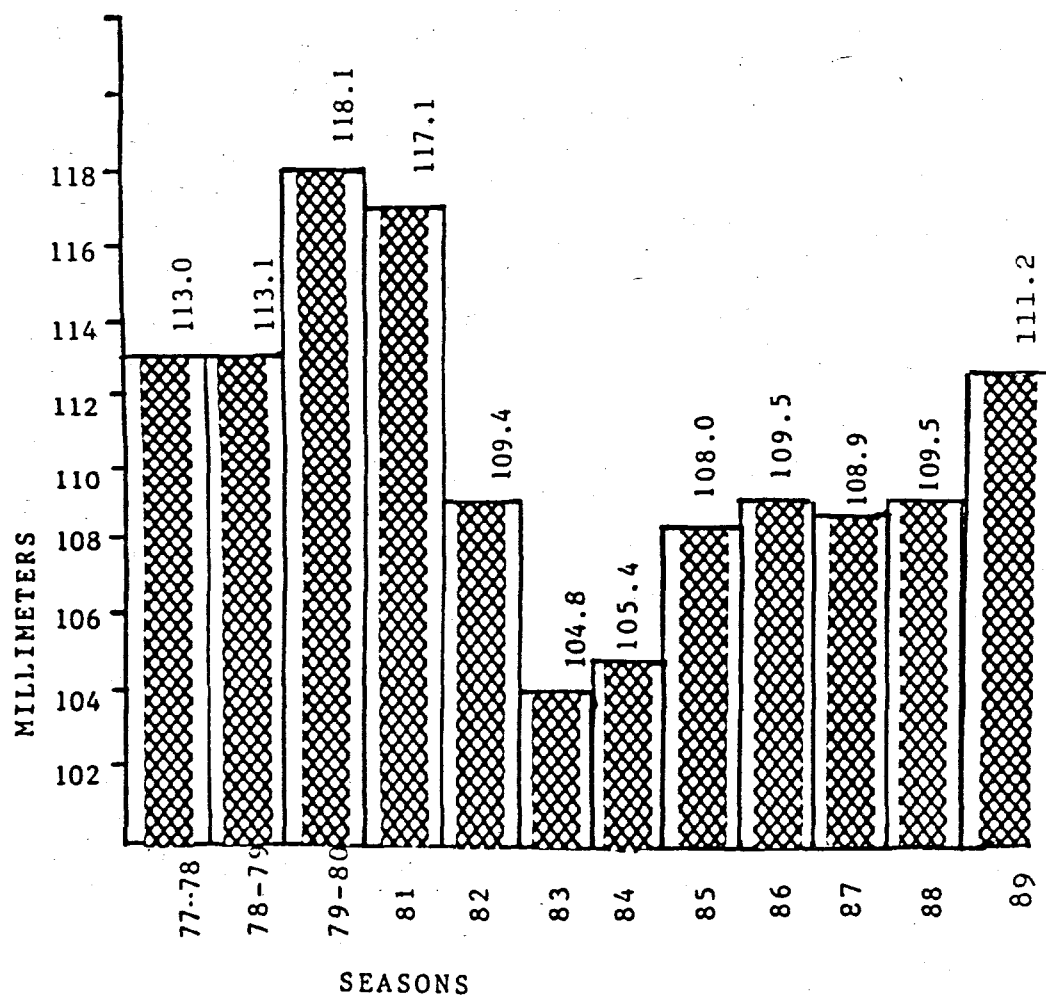


Figure 6. Historic Average Width Frequencies for the Bering Sea District, *C. opilio*.

KING CRAB REGISTRATION AREA 'T'

BRISTOL BAY

INTRODUCTION

The Bristol Bay king crab statistical registration Area 'T' includes all waters north of Cape Sarichef, east of 168° West longitude and south of the latitude of Cape Newenham and includes all waters of Bristol Bay.

HISTORIC BACKGROUND

Commercial king crab fishing in the Bering Sea began with the Japanese in 1930 and continued until 1940. They returned to the fishery in 1953 and remained until 1974. The Russian king crab fleet operated in the Eastern Bering Sea from 1959 through 1971. U.S. fishermen entered the Eastern Bering Sea king crab fishery with trawl gear in 1947. Effort and catches declined in the fifties with no catch being reported in 1959. A period of fluctuating low catches followed through 1966 before expanding to the current full scale fishery of the mid to late seventies. As in other areas of the State, the stocks crashed in the early eighties but unlike other areas in the State, appears to be slowly recovering.

With the decline of king crab stocks in other areas of the State in 1968, U. S. effort continued to increase in the Eastern Bering Sea with a record catch of 129.9 million pounds landed during the 1980 season.

The Eastern Bering Sea king crab fishery traditionally takes red king crab from the Bering Sea and Bristol Bay waters north of Unimak Island and the Alaska Peninsula from Cape Sarichef to Port Heiden.

In 1980 the Board of Fisheries made the Southeastern District of the Bering Sea, the major red king crab grounds, an exclusive registration area calling this area Bristol Bay, Registration Area 'T'. Vessels now registering for and fishing in this area are prohibited from fishing in any other exclusive registration area leaving only the Bering Sea, Area 'Q' and Adak, Area 'R', as alternative fishing areas.

The Area remained closed during the 1983/84 season due to the lowest ever recorded legal males as well as the lowest ever recorded total king crab population. Small females carrying fewer eggs and the high abundance of predators also contributed to the closure decision.

1989 FISHERY

During the summer of 1989, the National Marine Fisheries Service staff announced that based on last year's survey results and further analysis of the data, that a 1989 fishery in Bristol Bay would be unlikely but that the 1989 survey would be needed to confirm this. On July 17, 1989 a news release from Kodiak, announced to industry that the survey was still in progress, but a fishery at or above the 7.5 million pound harvest of 1988 could be expected and preseason harvest guidelines would be announced on August 15 for all Westward Region king crab fisheries. On August 15, a mid-point harvest guideline of 16.5 million pounds was announced. The population was still considered depressed, and the prerecruit crab were well below the average and declining.

During early September, reports coming from industry to the Department indicated a substantial amount of gear already on the Bristol Bay king crab grounds under the pretense of fishing for groundfish. In addition, the Dutch Harbor office was receiving daily inquiries and requests for groundfish pot registrations. Until this time there had been no documented groundfish pot fishery in the Bristol Bay area and clearly appeared to be only a way to

prospect or preempt the fishing grounds. After much discussion between the Alaska Department of Fish and Game and the National Marine Fisheries Service staffs, an emergency regulation was issued on September 15, 1989 stating that persons or vessels that fish pot gear in the waters of Area 'T' within five days of the scheduled king crab opening would be prohibited from participating in the king crab fishery. The regulation would not prohibit a vessel that was a directed groundfish vessel from continuing to fish with pots but only those wishing to register as a king crab vessel. After the emergency regulation and the news release were issued, interest in the groundfish pot fishery immediately diminished.

The Bristol Bay king crab fishery opened by regulation at 12:00 noon, September 25. Registrations and tank inspections were given at King Cove, Port Moller, Akutan and Dutch Harbor. A total of 212 vessels registered for the fishery, but due to mechanical problems one vessel was unable to make any landings. A total of over 55,000 pots were estimated on the grounds, 5,000 more than the 1988 fishery.

All catcher/processors and remote floater processors were required to have observers onboard. In addition to contract observers, Alaska Department of Fish and Game samplers were placed on two floaters at Port Moller to conduct registrations and tank inspections. They were then moved to the Alaska Department of Fish and Game field camp onshore to assist in daily radio reports and sample crab landed at the shore based plants.

There were no observer waivers granted to the remote floater processors, but most floater processors that returned to either Dutch Harbor or Akutan did discharge their observers and acted under other observer waivers for these two areas. None of the catcher processors that registered as a catcher only vessel and wished to process their crab after the closure either in Dutch Harbor or Akutan requested a waiver.

In addition to the daily reports required from the 18 catcher/processor observers, 20 voluntary catcher only vessels were given individual codes. All reports were to include the number of pots pulled, number of legal crab taken and the statistical area of the catch. A total of 30 to 38 reports were received daily and greatly assisted the staff with the management of the fishery by comparing average catch per pot and fishing effort distribution. Reports were to continue until the closure of the fishery, but most catcher vessels stopped reporting after the 72 hour closure announcement.

With an increase in the 1989 estimated harvest of over twice the 1988 harvest and only a slight increase in vessel effort over last year, a ten day to two week season was expected. As the season progressed, reported average daily catch per pot remained relatively constant at ten crabs per pot comparing more to the 1988 fishery than a fishery that should be producing twice as much catch. By October 1, the sixth day of the fishery, over 6.9 million pounds was estimated to be onboard the fleet with an average of only nine crabs per pot being caught. On October 2, Department staff in Dutch Harbor, along with a member of the National Marine Fisheries Service staff that was monitoring the fishery out of the Dutch Harbor office, agreed that the performance of the fishery to that time did not indicate that the 16.5 million pound mid-point was warranted but that 11.2, the lower end of the harvest guideline, could be obtained by October 6. The closure announcement for this date was made on October 3.

As stated catch reports were expected to continue, but due to some disagreement over the closure by the fleet, only a few catcher only vessels continued to report daily. Reported catch rates from catcher/processors did not improve and by the closure had dropped to an average of seven crabs per pot while the number of pots pulled and areas being fished increased. Mid-season deliveries had

occurred to more of the floater processors at Port Moller assisting with information on average weights and crab conditions, as well as general fishing conditions.

With the continued decline in the average catch per pot until the season closed, only 10.3 million pounds were landed by the fleet. The ex-vessel value of the fishery was over 51 million dollars. The season average was eight crabs per pot, identical to the 1988 season, and the average of 6.1 pounds per crab was only a tenth of a pound larger (Table 1).

Catcher/processors averaged over 74,000 pounds per vessel, while the catcher only vessels averaged 46,300 pounds per vessel. The catcher/processors averaged 9.4 crabs per pot, 2.5 crabs more than that of the catcher only vessels (Table 4).

With an anticipated increased harvest guideline of 16.5 million pounds and the continued closures of other king crab areas, smaller boat effort entered the fishery from as far away as Southeastern Alaska. The average vessel keel length decreased from 110.9 feet in 1988 to 106.0 feet for 1989. The commercial fishery covered over 25,200 square miles, 1,800 more than the 1988 season (Table 3, Figure 1). As in the 1988 fishery, the majority of the catch, 57.6 percent or 5.9 million pounds, came from six statistical areas, and two of these areas produced 31.6 percent or 3.2 million pounds of the season's total (Table 3, Figure 1).

STOCK STATUS

According to the 1989 National Marine Fisheries Service summer survey report, the estimated abundance of legal male red king crabs in the Bristol Bay area represents a significant increase of 86 percent from 1988 to 1989. A large portion of this increase consisted of postrecruit crabs which increased 170 percent over the 1988 survey. Prerecruit crabs increased only slightly by 47 percent.

Table 1. Historic U.S. Red King Crab catch in the Bristol Bay Registration Area 'T' of the Bering Sea, 1966 to 1989.

Year	Vessels	Landings	No. Crab ¹	No. Pounds ¹	Pots Lifted	Avg. Wt.	Avg. Length	CPUE	% Old Shell	Deadloss
1966	9	15	140,554	997,321	2,720	7.1		52		
1967	20	61	397,307	3,102,443	10,621	7.8		37		
1968	59	261	1,278,592	8,686,546	47,496	6.8		27		
1969	65	377	1,749,022	10,403,283	98,426	5.9		18		
1970	51	309	1,682,591	8,559,178	96,658	5.1		17		
1971	52	394	2,404,681	12,955,776	118,522	5.4		20		
1972	64	611	3,994,356	21,744,924	205,045	5.4		20		
1973	67	441	4,825,963	26,913,636	194,095	5.6		25		N/A
1974	104	605	7,710,317	42,266,274	212,915	5.5		36		N/A
1975	102	592	8,745,294	51,326,259	205,096	5.7		43		1,639,483
1976	141	984	10,603,367	63,919,728	321,010	6.0	147.9	33	27.4	875,327
1977	130	1,020	11,733,101	69,967,868	451,273	5.9	147.9	26	13.0	730,279
1978	162	926	14,745,709	87,618,320	406,165	5.8	147.0	36	6.9	1,273,037
1979	236	889	16,808,605	107,828,057	315,226	6.4	152.3	53	10.4	3,555,891
1980	236	1,251	20,845,350	129,948,463	567,292	6.2	151.1	37	11.0	1,858,668
1981	177	1,026	5,307,947	33,591,368	542,250	6.3	151.1	10	47.4	711,289
1982	90	255	541,006	3,001,210	141,656	5.6	145.2	4	24.6	95,834
1983		N O	C O M M E R C I A L F I S H E R Y							
1984	89	137	794,040	4,182,406	112,556	5.2	142.4	7	26.5	35,601
1985	128	130	796,181	4,174,953	85,003	5.5	142.3	9	25.8	6,436
1986	159	230	2,099,576	11,393,934	178,370	5.4	142.2	12	25.5	284,127
1987	236	311	2,122,402	12,289,067	220,871	5.8	144.7	9	19.0	120,388
1988	200	201	1,236,131	7,387,795	153,004	6.0	146.9	8	15.1	23,537
1989	211	287	1,684,706	10,264,791	208,684	6.1	148.4	8	17.7	81,334

¹ Deadloss included

Table 2. Bering Sea red king crab harvest composition by fishing season, 1973 through 1989.

Season	Opened-Closed	Catch ¹	Percent Recruit ²	Percent Post Recruit ²	Size Limit	Average Price Per Pound
1973	06/15-09/09	28.2	63	37	6½" 03/01-10/31 6½" 11/01-01/28	- \$.84
1974	07/29-10/12	41.9	60	40	6½" 03/01-10/31 6½" 11/01-01/18	- \$.38
1975	08/01-11/16	51.3	21	79	6½" 03/01-10/31 6½" 11/01-02/28	- \$.38
1976	08/15-12/07	63.9	56	44	6½"	\$.58
1977	09/15-12/08	70.0	67	33	6½"	\$1.11
1978	09/10-10/23	87.6	75	25	6½"	\$1.23
1979	09/15-10/14	107.8	47	53	6½"	\$1.01
1980	09/10-10/20	129.9	44	56	6½"	\$.90
1981	09/10-10/20 10/25-12/15	32.0 1.5	- 14	- 86	6½" 7"	- \$1.50
1982	09/10-10/10	2.7	68	32	6½"	\$3.05
1983	N O C O M M E R C I A L F I S H E R Y					
1984	10/01-10/16	4.2	59	41	6½"	\$2.60
1985	09/25-10/02	4.1	66	34	6½"	\$2.90
1986	09/25-10/07	11.4	65	35	6½"	\$4.05
1987	09/25-10/06	12.3	77	23	6½"	\$4.00
1988	09/25-10/02	7.4	59	41	6½"	\$5.10
1989	09/25-10/06	10.3	58	42	6½"	\$5.00

¹ Deadloss included

² Recruits figured at 149mm - all previous years, 155mm

Table 3. 1989 Bristol Bay king crab catch by Statistical Area.

Statistical Area	Landings	Crab ¹	Pounds ¹	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
605630	4	30,543	189,032	3,115	6.19	10	2,500
615601	10	37,710	237,444	5,003	6.30	7	0
615630	48	257,095	1,586,804	30,777	6.17	8	13,969
615700	7	49,777	302,488	5,465	6.08	9	0
625600	30	163,442	998,668	16,435	6.11	10	9,890
625630	32	270,005	1,655,871	27,102	6.13	10	13,286
625700	9	69,326	424,681	10,087	6.13	7	3,316
635530	26	104,893	626,509	16,202	5.97	6	6,536
635600	18	82,154	500,542	9,377	6.09	9	5,130
635630	19	141,129	837,723	14,425	5.98	10	7,400
635700	20	112,610	685,013	15,279	6.08	7	924
645530	9	53,302	319,583	9,461	6.00	6	0
645600	10	52,903	320,863	9,392	6.07	6	0
645630	19	146,492	882,987	18,158	6.03	8	9,105
645700	7	31,108	187,464	5,031	6.03	6	7,378
All Others	19	82,217	503,104	13,375	6.12	6	1,900
Season Totals	287	1,684,706	10,264,791	208,684	6.09	8	81,334

¹ Deadloss included

Table 4. Comparative average catches of catcher/processor vs catcher vessels.

	SEASONS					
	1989	1988	1987	1986	1985	1984
Number of Catcher/Processors	18	20	21	12	12	10
Number of Catchers	193	180	215	147	116	79
Pounds of C/P Catch	1,334,083	994,546	2,342,142	1,182,866	820,013	686,302
Percent of C/P Catch ¹	13.0	13.5	19.0	10.4	19.6	16.4
Average C/P Catch	74,116	49,727	111,530	93,572	68,334	68,630
Average Catcher Catch ²	46,273	35,515	46,265	69,463	28,922	44,254
Average CPUE C/P's	9.4	7.8	13.8	12.1	14.2	7.7
Average CPUE Catchers	7.9	8.2	8.9	11.7	9	7
Total Catch	10,264,791	7,387,258	12,289,067	11,393,934	4,174,983	4,132,406
Average # Pots Pulled C/P's	1,289	1,039	1,376	1,502	898	1,613.5
Average # Pots Pulled Catcher	961	730	893	1,091	640	1,220.5
C/P Range Catch	21,905- 185,408	19,796- 98,875	5,300- 268,750	34,097- 179,415	19,865- 120,924	10,219- 163,346

¹ C/P total catch divided by Total Catch

² Total catch less C/P catch divided by number catcher only vessels

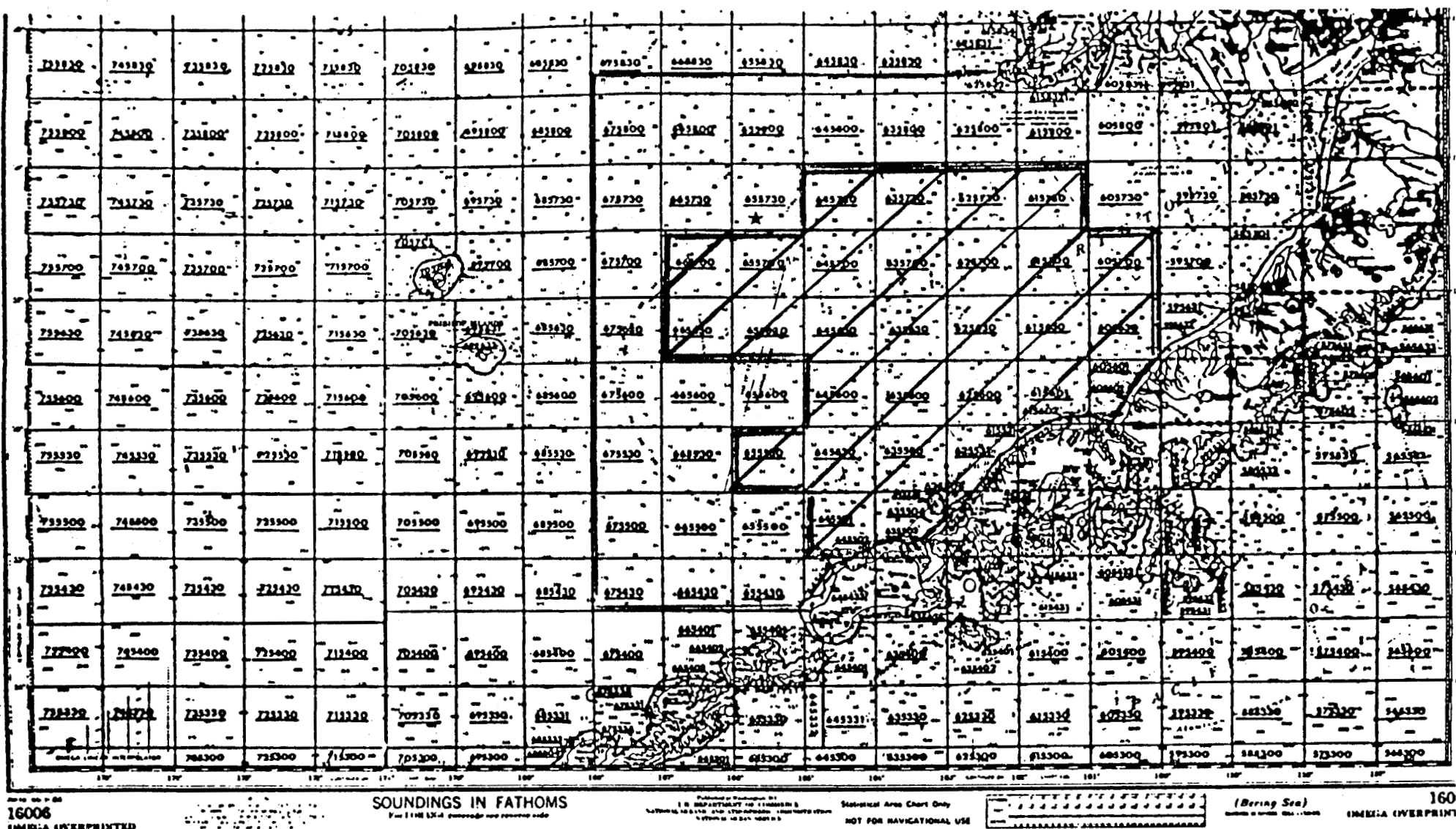


Figure 1. 1989 Red King catch distribution in the Bristol Bay area.

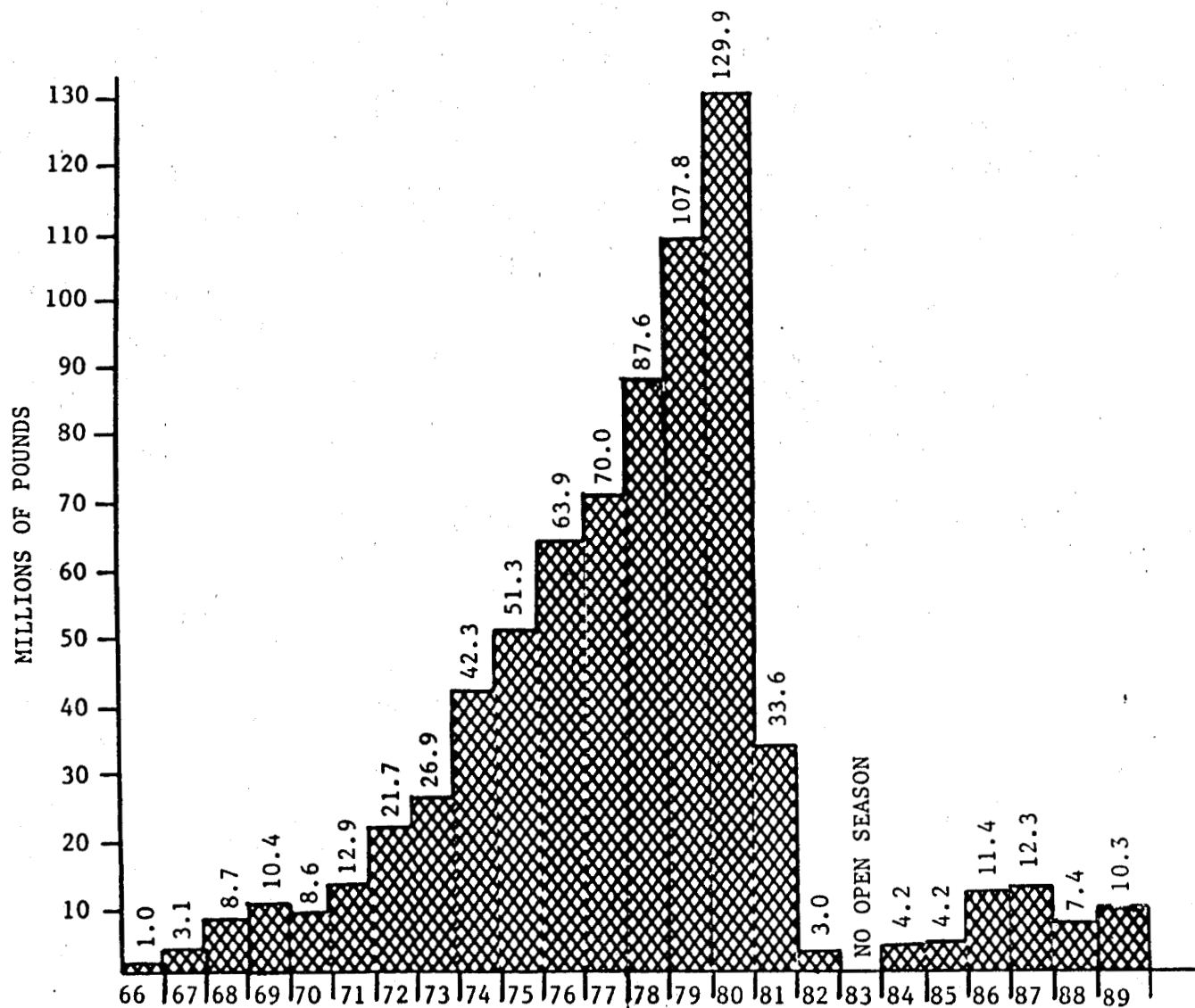


Figure 2. Historic U.S. red king crab catch in the Bristol Bay Registration Area "T" of the Bering Sea.

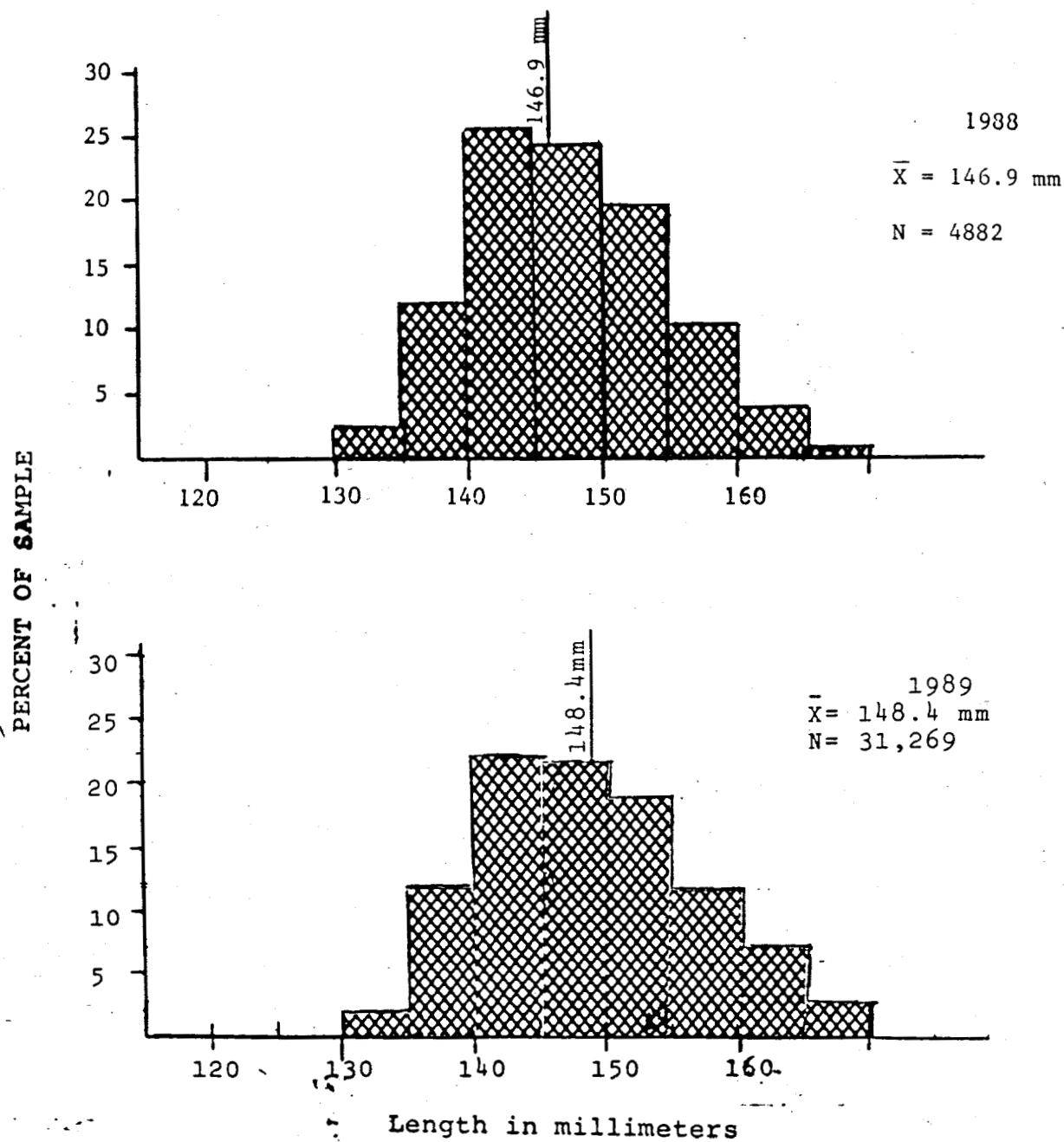


Figure 3. Red King Length Frequency Distribution from the Bristol Bay area.

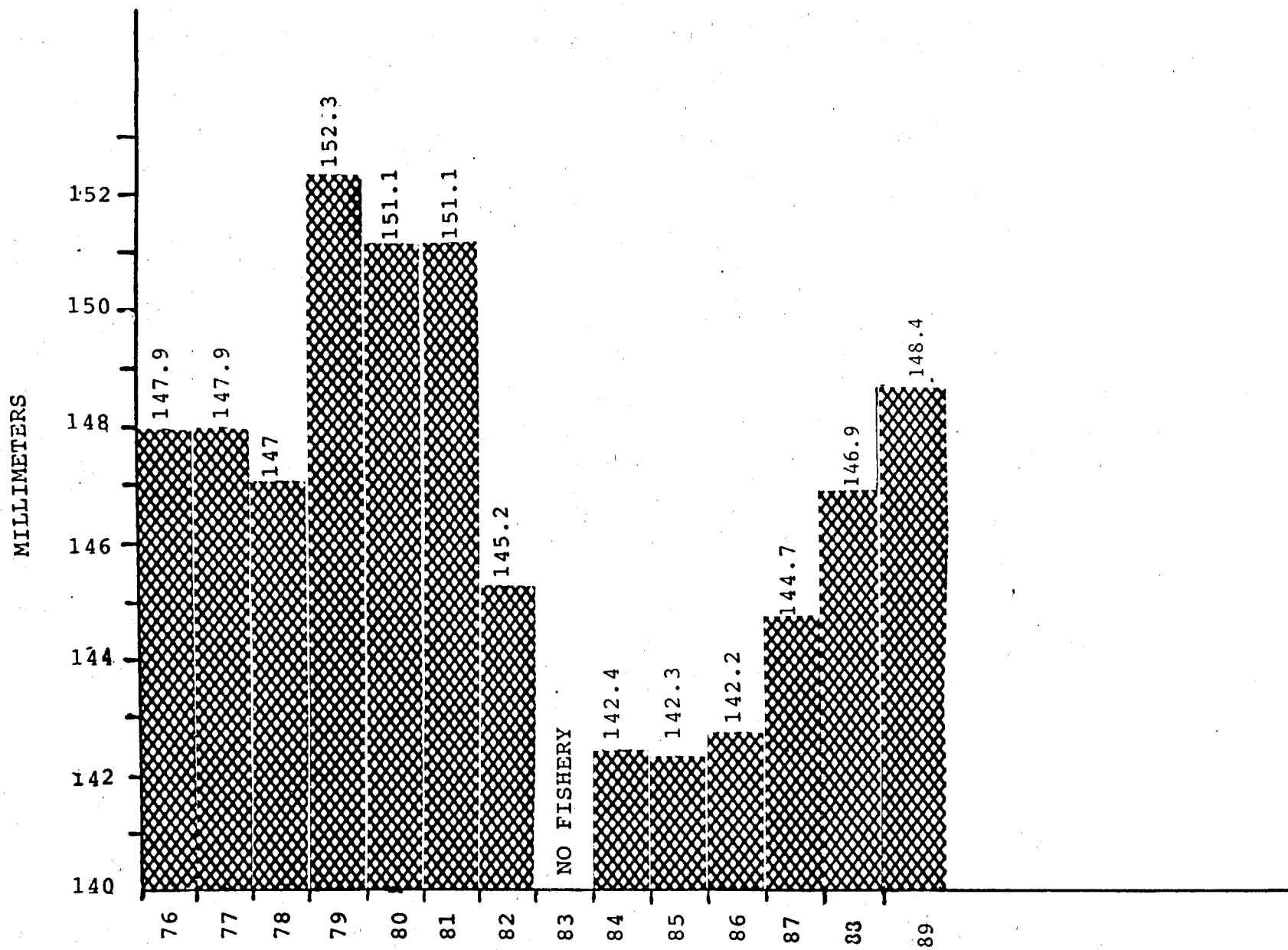


Figure 4. Historic Bristol Bay red king crab average length frequencies.

KING CRAB STATISTICAL AREA 'Q'
BERING SEA

DESCRIPTION

The Bering Sea king crab area, Statistical Area 'Q', includes all waters west of 168° West longitude to the U.S. Russian Convention Line of 1867 and north to the latitude of Cape Newenham at 58° 39' North latitude including the waters of the Chukchi Sea. This registration area is separated into the Pribilof and Northern Districts. The Northern District is further separated in two sections; the Norton Sound Section which includes all waters east of 168° West longitude and north of the latitude of Cape Romanzof, and the General Section which includes all waters not described in the Norton Sound Section.

HISTORIC BACKGROUND

The blue king crab fishery in the Pribilofs started in 1973 when vessels targeted on blue king crab stocks between St. George and St. Paul Islands during the summer months when the red king crab fishery was closed. The first reported catch was 1.2 million pounds taken by eight vessels between July and October. The crab averaged 7.3 pounds per crab, and the catch per unit effort (CPUE) was 26 crabs per pot. The average weight has remained relatively constant to that of the red king crab stocks. The CPUE of 26 crabs per pot has never again been attained by the fleet averaging only nine crabs per pot until the past three seasons when the CPUE dropped to three crabs and less per pot (Table 1).

PRIBILOFS - 1989

The 1989 National Marine Fisheries Service survey of the Pribilof blue king crab stocks estimated the abundance of legal males to be 225,000 crabs, only 48,000 crabs more than in 1988. This

population is still at its lowest estimate in the history of the survey and is approximately 2% of the legal male population of 9.4 million animals observed in 1977 and one third of the last four years' average. In addition, a very few number of prerecruits were caught.

Both National Marine Fisheries Service and Department staff met to discuss the survey results and agreed that the population size of the Pribilof blue king crab stocks were in such poor condition that no season was warranted and the season was closed by emergency order.

ST. MATTHEW - 1989

The St. Matthew season opened on September 1, 1989 with a preseason harvest guideline of 1.0 to 2.5 million pounds. The mid-point harvest guideline was 1.7 million pounds. Registrations and tank inspections were given on the fishing grounds by Alaska Department of Fish and Game personnel to 69 vessels including 16 catcher processors. Six floater processors were also on the grounds. The vessel effort was a 48% increase and the 12,000 pots registered for the fishery was a 54% increase over the 1988 fishery. With the increased effort levels and the continued concern with the depressed stock status the ADF&G staff managed the fishery conservatively. The season lasted three and one half days and produced a catch of 1.2 million pounds (Table 2).

Observers were placed on all fifteen catcher processors and the six floaters. In addition, three Alaska Department of Fish and Game personnel were placed onboard the floaters to conduct registrations and tank inspections and, for the first time, to monitor the sampling procedures of the third party contract observers. Of the three observed, two lacked any prior crab experience and were further trained by Alaska Department of Fish and Game personnel on how to properly measure and age crab and conduct proper interviews. The report on observers will cover these problems further.

Reports were received daily from all observers on the grounds, but the fifteen reports from the catcher processors were used to monitor and manage the fishery. Daily catch rates ranged from less than 1 crab per pot to over 25 crabs per pot, but averaged only 8 for the season, 5 less than the 1988 fishery.

On September 3, only two days into the fishery, Alaska Department of Fish and Game estimated over 880,000 pounds to be onboard the fleet. With a reported increase in the legal male population being estimated by National Marine Fisheries Service, but a daily catch per pot being reported below the average of the 1988 fishery and the reported need by the fleet for at least a 24 hour closure announcement, Alaska Department of Fish and Game announced the closure for 12:00 midnight, September 4. The Alaska Department of Fish and Game estimated the total catch, based on the averages of the catcher processing fleet, to be 1.7 million pounds by the closure.

The catcher processing fleet averaged over 30,800 pounds per vessel, with a harvest range of 16,700 pounds to over 43,650 pounds, while the catcher only vessels averaged just over 13,000 pounds per vessel, (Table 5).

Upon receiving interviews from the observers onboard the floating processors, fifteen fishing vessels were randomly selected and their daily catches analyzed from the interview forms. It appears that the catcher only vessels averaged four crabs per pot less than the catcher processors and that all catches decreased drastically the last day of the fishery. Catcher processing vessels registered an average of 263 pots per vessel while the catcher only fleet averaged 149 pots per vessel. In remote area fisheries, such as St. Matthew where one deck load is generally used in the fishery, it appears that the advantage of being able to set a large number of pots and have them fishing at one time is an advantage over

having less pots fishing that have the same soak period before they can be pulled. Catcher processors averaged 618 pot pulls during the season while catcher vessels averaged only 399 pot pulls.

The season catch was 1.2 million pounds. Catches were delivered to six floater processors, numerous catcher processors and to shore based plants in Dutch Harbor. The fishery was valued at over 3.4 million dollars to the fleet.

STOCK STATUS

According to the 1989 National Marine Fisheries Service Report to the North Pacific Fisheries Management Council, "The estimated abundance of legal crab was 1.48 million crab, a nonsignificant increase...and the abundance of prerecruits showed no significant change...".

Table 1. Historic blue king crab catch Bering Sea, Area 'Q', Pribilof District.

Year	Vessels	Landings	Crab ¹	Pounds ¹	Pots Lifted	CPUE	Avg. Wt.	Average Length	Pounds Deadloss
1973/74	8	13	174,420	1,276,533	6,814	26	7.3	N/A	0
1974/75	70	101	908,072	7,107,294	45,518	20	7.8	157.8	0
1975/76	20	54	314,931	2,433,714	16,297	19	7.7	159.1	0
1976/77	47	113	855,505	6,611,084	71,738	12	7.7	158.1	0
1977/78	34	104	807,092	6,456,738	106,983	8	7.9	158.9	159,269
1978/79	58	154	797,364	6,395,512	101,117	8	8.1	159.3	63,140
1979/80	46	115	815,557	5,995,231	83,527	9	7.7	155.9	284,555
1980/81	110	258	1,497,101	10,970,346	167,684	9	7.3	155.7	287,285
1981/82	99	312	1,202,499	9,080,729	176,168	7	7.6	158.2	250,699
1982/83	122	281	587,908	4,405,353	127,728	5	7.5	159.8	51,703
1983/84	126	221	276,364	2,193,395	86,428	3	7.9	159.9	4,562
1984/85	16	25	40,427	306,699	15,147	3	7.6	155.45	0
1985/86	26	49	77,607	532,735	23,483	3	6.9	146.52	7,500
1986/87	16	25	36,988	258,939	15,800	2	7.0	N/A	5,450
1987/88	38	68	95,131	701,337	40,507	2	7.4	152.72	9,910
1988/89			S E A S O N		C L O S E D				
1989/90			S E A S O N		C L O S E D				

¹ Deadloss included.

Table 2. Historic blue king crab catch in the Northern District of statistical Area 'Q' (St. Matthew and St. Lawrence Islands).

Year	Vessels	Landings	Crab ¹	Pounds ¹	Pots Lifted	CPUE	Percent Oldshell	Avg. Wt.	Avg. Length	Pounds Deadloss
1977	10	24	281,665	1,202,066	17,370	16	7.0	4.3	130.4	129,148
1978	22	70	436,126	1,984,251	43,754	9	N/A	4.5	132.2	116,037
1979	18	25	52,966	210,819	9,877	5	80.8	4.0	128.8	56,147
1980			Confidential				N/A	4.7	N/A	
1981	31	119	1,045,619	4,627,761	58,550	18	N/A	4.4	N/A	53,355
1982	96	269	1,935,886	8,844,789	165,618	12	19.6	4.6	135.1	142,973
1983 ²	164	235	1,931,990	9,454,323	133,944	14	26.7	4.8	137.2	828,994
3	13	13	11,264	52,557	3,975	3	-	4.7	-	3,500
1984 ²	90	169	841,017	3,764,592	73,320	11	34	4.5	135.48	31,983
3			N O	R E P O R T E D		L A N D I N G S				
1985 ²	79	103	484,836	2,427,110	51,606	9	9	5.0	138.98	2,613
3			N O	R E P O R T E D		L A N D I N G S				
1986 ²	38	43	219,548	1,003,162	22,093	10	10	4.6	134.33	32,560
3			N O	R E P O R T E D		L A N D I N G S				
1987 ²	61	62	234,521	1,075,179	28,440	8	5	4.6	134.13	400
3			N O	R E P O R T E D		L A N D I N G S				
1988 ²	46	46	302,053	1,325,185	10,160	13	65	4.4	133.29	22,358
3			N O	R E P O R T E D		L A N D I N G S				
1989 ²	69	69	247,641	1,166,258	30,853	8	9	4.7	134.55	3,754
3	5	9	1,652	4,518	2,402	-	-	-	-	0

¹ Deadloss included

² St. Matthew

³ St. Lawrence - Red and Blue

Table 3. Northern District, Area 'Q' king crab harvest composition by fishing season.

Season	Opened	Closed	Species	Catch ¹	Size Limit	Price Per Lb.
1977	June 7	Aug. 16	Blue	1,202,066	5 1/2"	\$ 1.00
			Red	543,041	5"	
1978	July 15	Sept. 3	Blue	1,984,251	5 1/2"	.95
	July 15	Aug. 16	Red	2,007,910	4 3/4"	
1979	July 15	Aug. 24	Blue	210,819	5 1/2"	.70
	July 15	Aug. 16	Red	3,024,228	4 3/4"	
1980	July 15	Sept. 3	Blue	Confidential		
	July 15	July 31	Red ²	353,683	4 3/4"	
1981	July 15	Aug. 21	Blue	4,627,761	5 1/2"	.90
	July 15	Sept. 3	Red ²	63,983	4 3/4"	
1982	Aug. 1	Aug. 16	Blue	8,844,789	5 1/2"	2.00
	Aug. 1	Aug. 16	Red ²	3,690	4 3/4"	2.00
	May 1	Aug. 1	Brown	193,507	5 1/2"	2.00
1983 ³	Aug. 20	Sept. 6	Blue	9,506,880	5 1/2"	3.00
	Aug. 20	Sept. 6	Red	1,635	4 3/4"	2.50
	May 1	Aug. 1	Brown		5 1/2"	-
1984	Aug. 1	Sept. 8	Blue	3,764,592	5 1/2"	1.75
	Aug. 1	Sept. 8	Red ²	-	4 3/4"	-
	May 1	Dec. 31	Brown ³	-	5 1/2"	-
1985	Sept. 1	Sept. 6	Blue	2,427,110	5 1/2"	1.60
	Aug. 1	Sept. 6	NO CATCH REPORTED		4 3/4"	-
	Jan. 1	Dec. 31	NO CATCH REPORTED		5 1/2"	-
1986	Sept. 1	Sept. 6	Blue	1,003,162	5 1/2"	3.20
	Aug. 1	Sept. 6	NO CATCH REPORTED		4 3/4"	-
	Jan. 1	Dec. 31	NO CATCH REPORTED		5 1/2"	-
1987	Sept. 1	Sept. 5	Blue	1,075,179	5 1/2"	2.85
	Aug. 1	Sept. 5	NO CATCH REPORTED		4 3/4"	-
	Jan. 1	Dec. 31	Brown	424,394	5 1/2"	2.60
1988	Sept. 1	Sept. 5	Blue	1,325,185	5 1/2"	3.10
	Aug. 1	Sept. 5	NO CATCH REPORTED		4 3/4"	-
	Jan. 1	Dec. 31	Brown	160,441	5 1/2"	3.10
1989	Sept. 1	Sept. 4	Blue	1,166,258	5 1/2"	2.90
			Blue	**	5 1/2"	NA
	Aug. 1	Sept. 4	Red ²	4,518	4 3/4"	-
	Jan. 1	Dec. 31	Brown	Confidential		

¹ Deadloss included

² Does not include Norton Sound

³ Some of Northern District open until September 20

**Combined with red king crab to total 4,518 lbs.

Table 4. Bering Sea (Northern District) blue king crab catch by statistical area, for the 1989 season St. Matthew Island.

Statistical Area	Landings	Crab ¹	Pounds ¹	Pots Lifted	Avg. Wt.	CPUE	Pounds Deadloss
726001	27	92,493	433,834	12,370	4.7	8	1,351
726002	8	19,171	91,512	2,894	4.8	7	0
736001	28	118,002	554,935	13,373	4.7	9	2,403
All Others	6	17,975	85,935	2,216	4.8	8	0
TOTAL	69	247,641	1,166,258	30,853	4.7	8	3,754

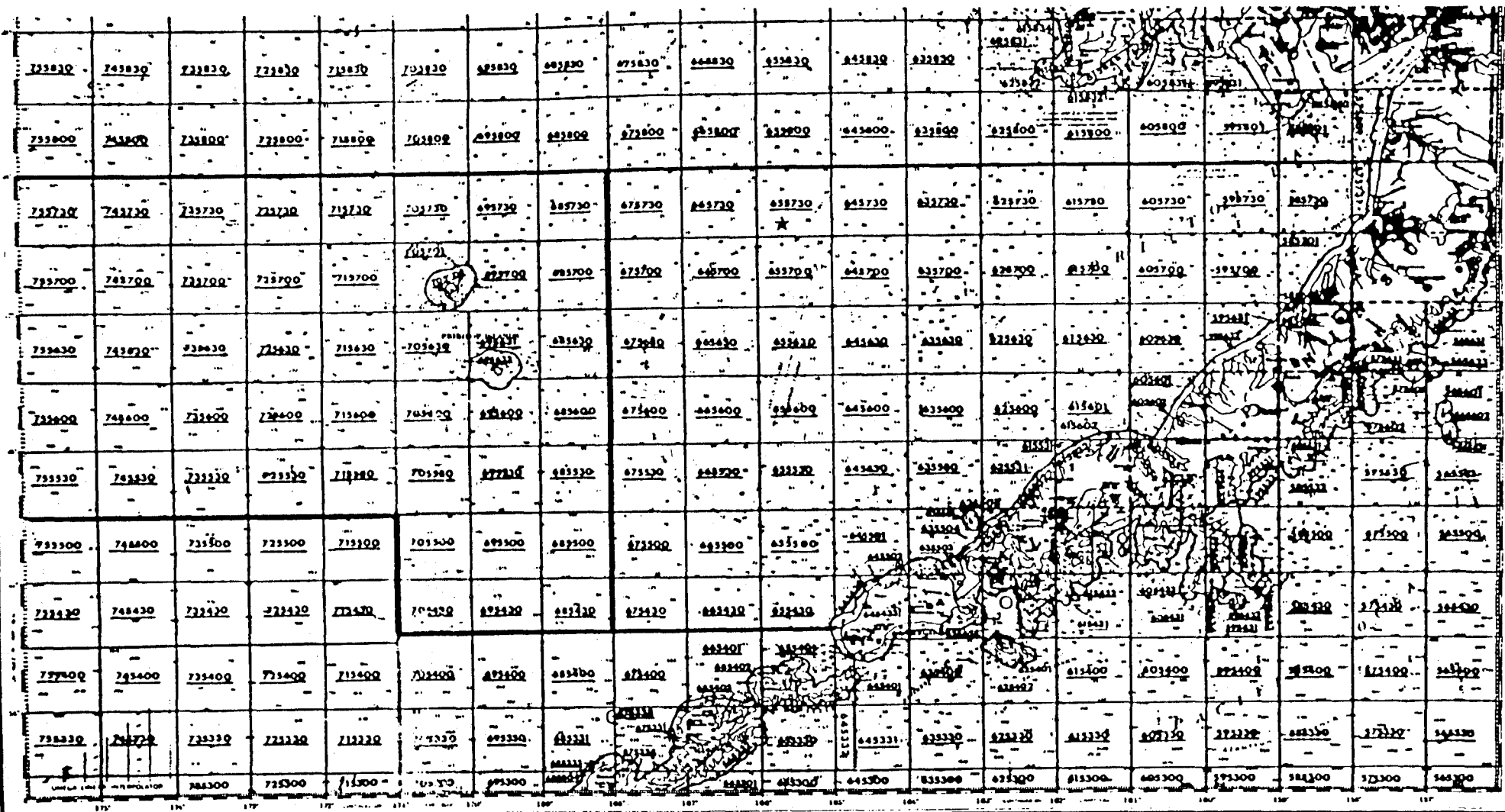
¹ Deadloss

Table 5. St. Matthew Blue King crab comparative average catches of catcher/processor vs. catcher vessels.

	SEASONS				
	1989	1988	1987	1986	1985
Number of Catcher/Processors	15	9	13	6	10
Number of Catchers	54	37	48	32	69
Pounds of C/P Catch	462,034	462,851	336,460	207,745	498,374
Percent of C/P Catch	39.6	34.9	31.3	20.7	20.5
Average C/P Catch	30,802	51,428	25,881	34,624	49,837
Average Catcher Catch	13,041	23,306	15,390	21,498	27,953
Average CPUE C/P's	11	16	10.5	11.8	12.4
Average CPUE Catchers	7	12	7.5	9.5	8.8
Total Catch	1,166,258	1,325,185	1,075,179	1,003,162	2,427,110
Average # Pots Pulled C/P's	618	706	540	625	834.4
Average # Pots Pulled Catcher	399	432	446	473	634.0
C/P Range Catch	16,744- 43,650	39,375- 71,170	15,010- 50,319	24,651- 43,007	24,440- 76,396

Table 6. St. Matthew comparative mid-point and emergency order projections and actual harvests.

Year	Harvest Guideline	Mid-Point	Harvest	E.O. Projection
1983	8.0	8.0	9,454,000	8.0
1984	2.0 - 4.0	3.0	3,764,000	4.0
1985	0.9 - 1.9	1.4	2,427,000	2.0
1986	0.2 - 0.5	0.3	1,003,000	1.0
1987	0.6 - 1.3	.95	1,075,000	1.3
1988	0.7 - 1.5	1.1	1,325,000	1.5
1989	1.7	1.7	1,166,000	1.7



16006
 SOUNDINGS IN FATHOMS
 (Bering Sea)
 NOT FOR NAVIGATIONAL USE
 160
 OMEGA OVERPRINT

Figure 1. Southeastern Bering Sea Statistical Areas

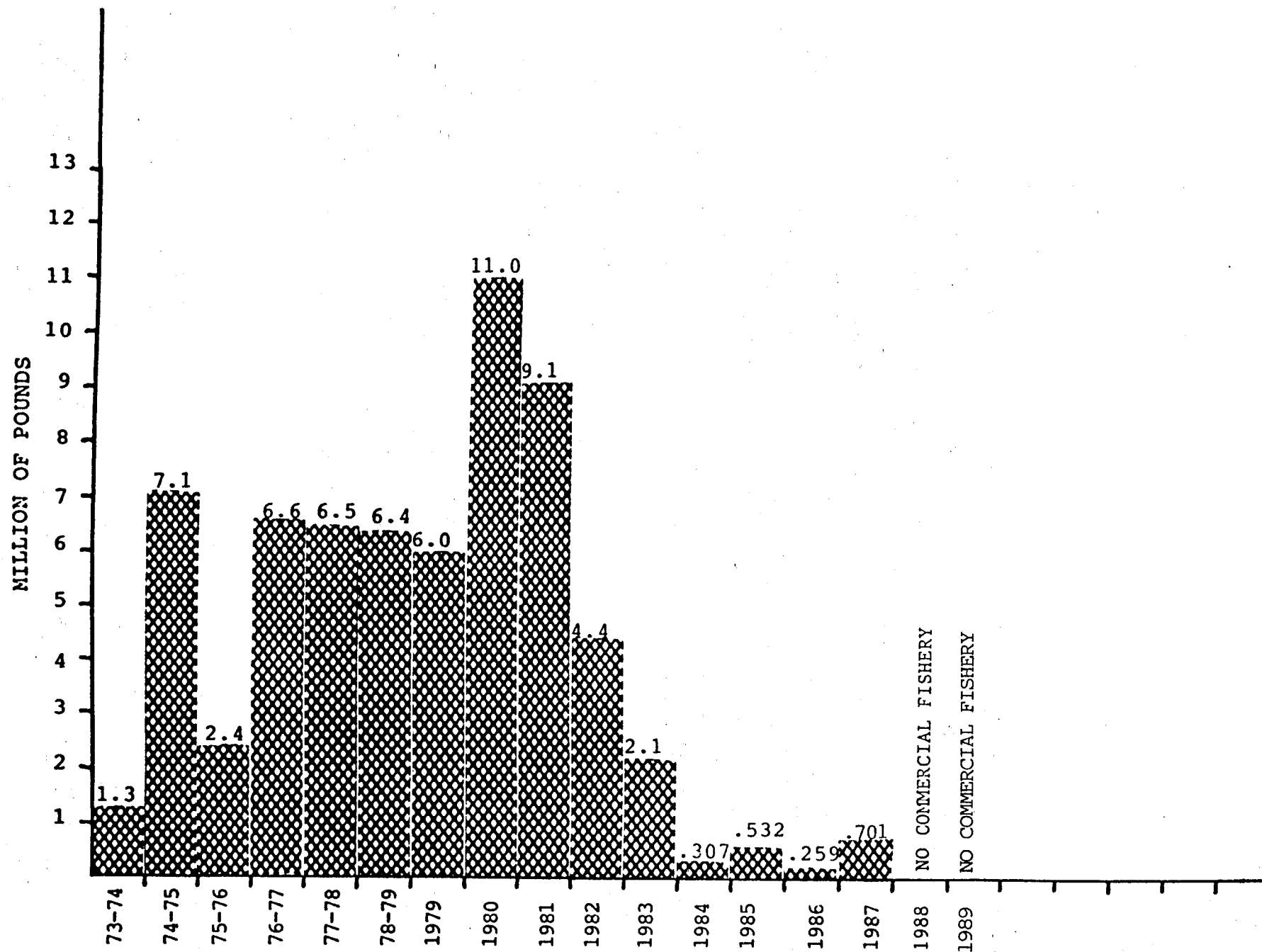


FIGURE 2. PRIBILOF BLUE KING CRAB HISTORICAL CATCH.

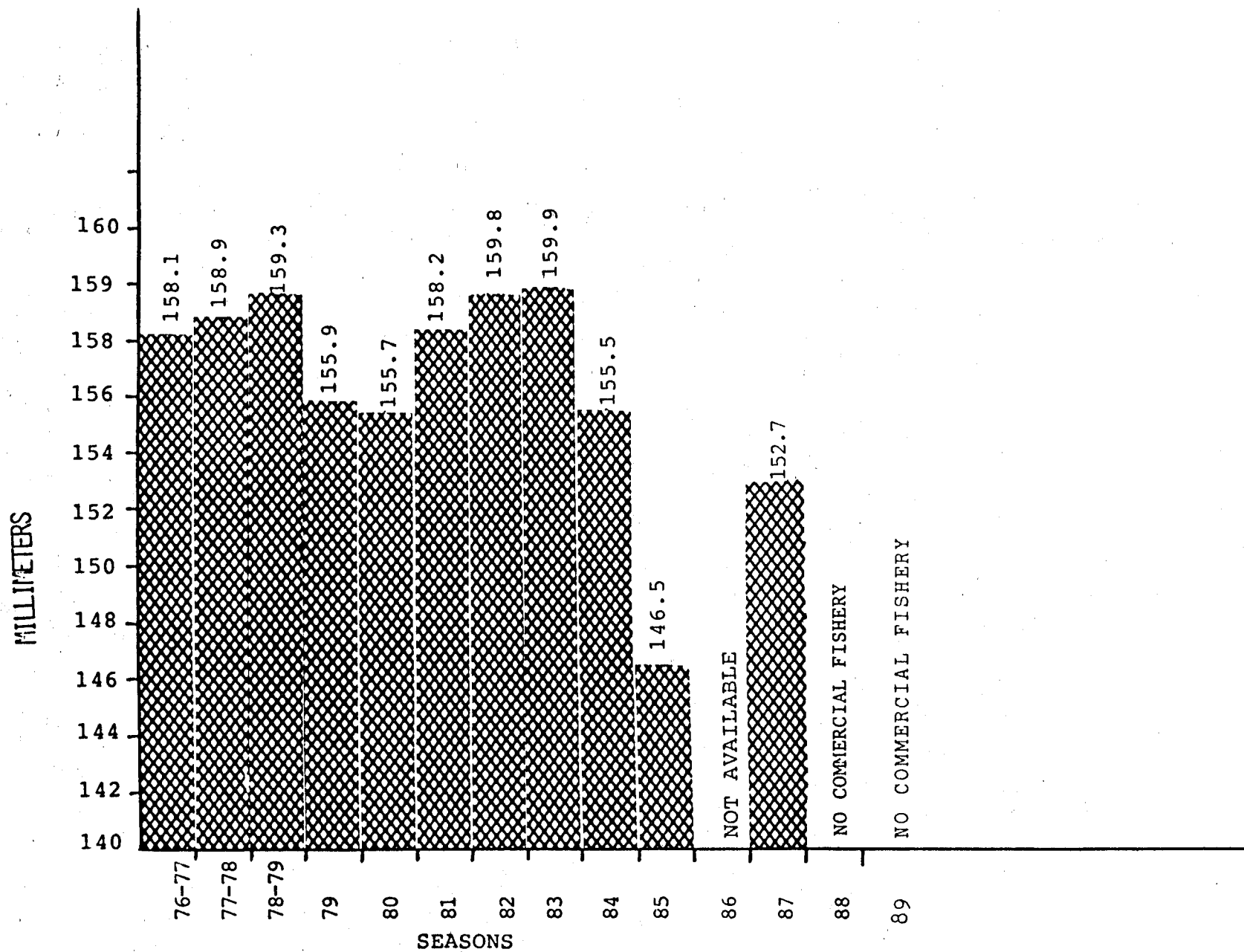


Figure 3. Historic Pribilof District blue king crab average length frequencies.

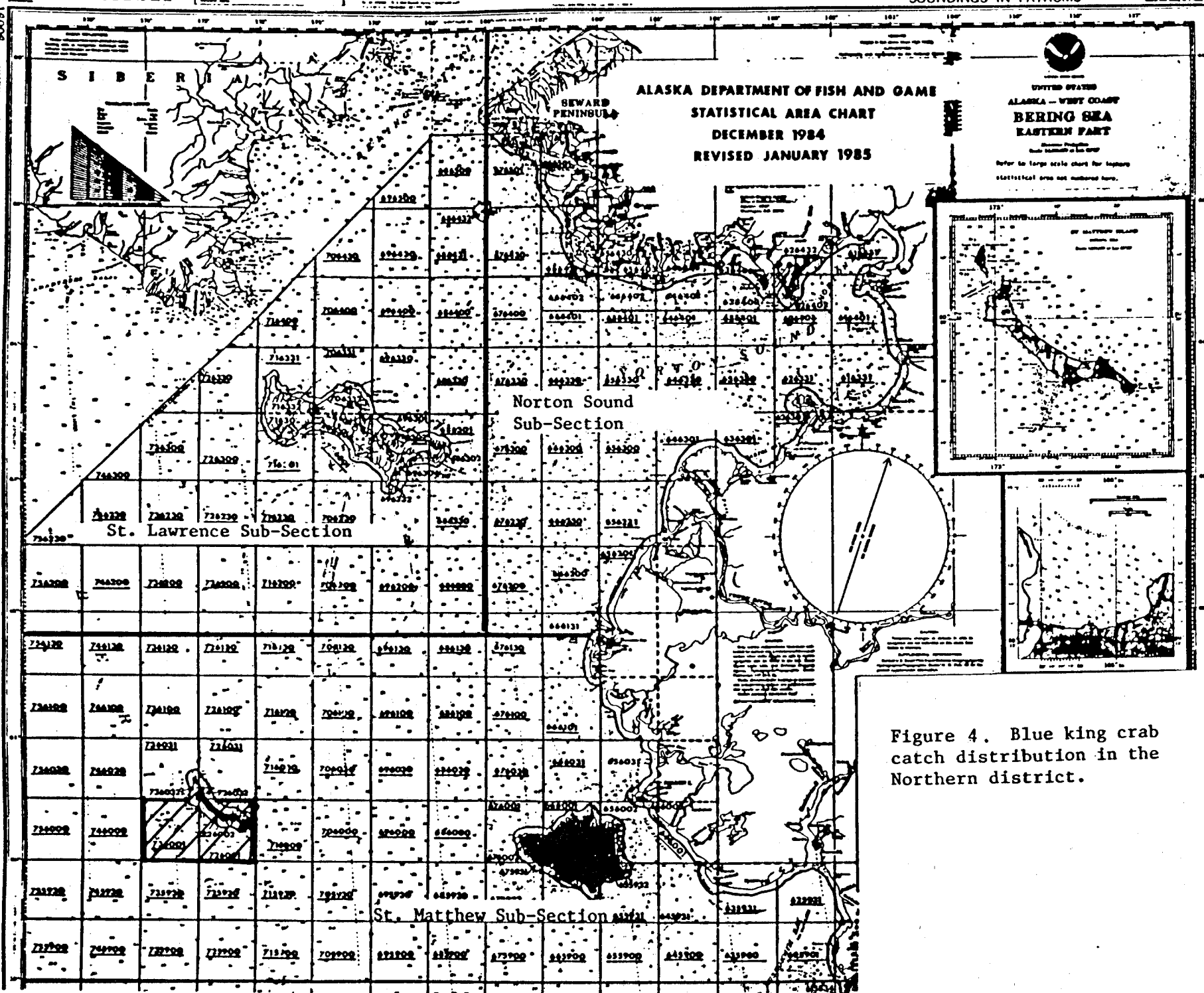


Figure 4. Blue king crab
catch distribution in the
Northern district.

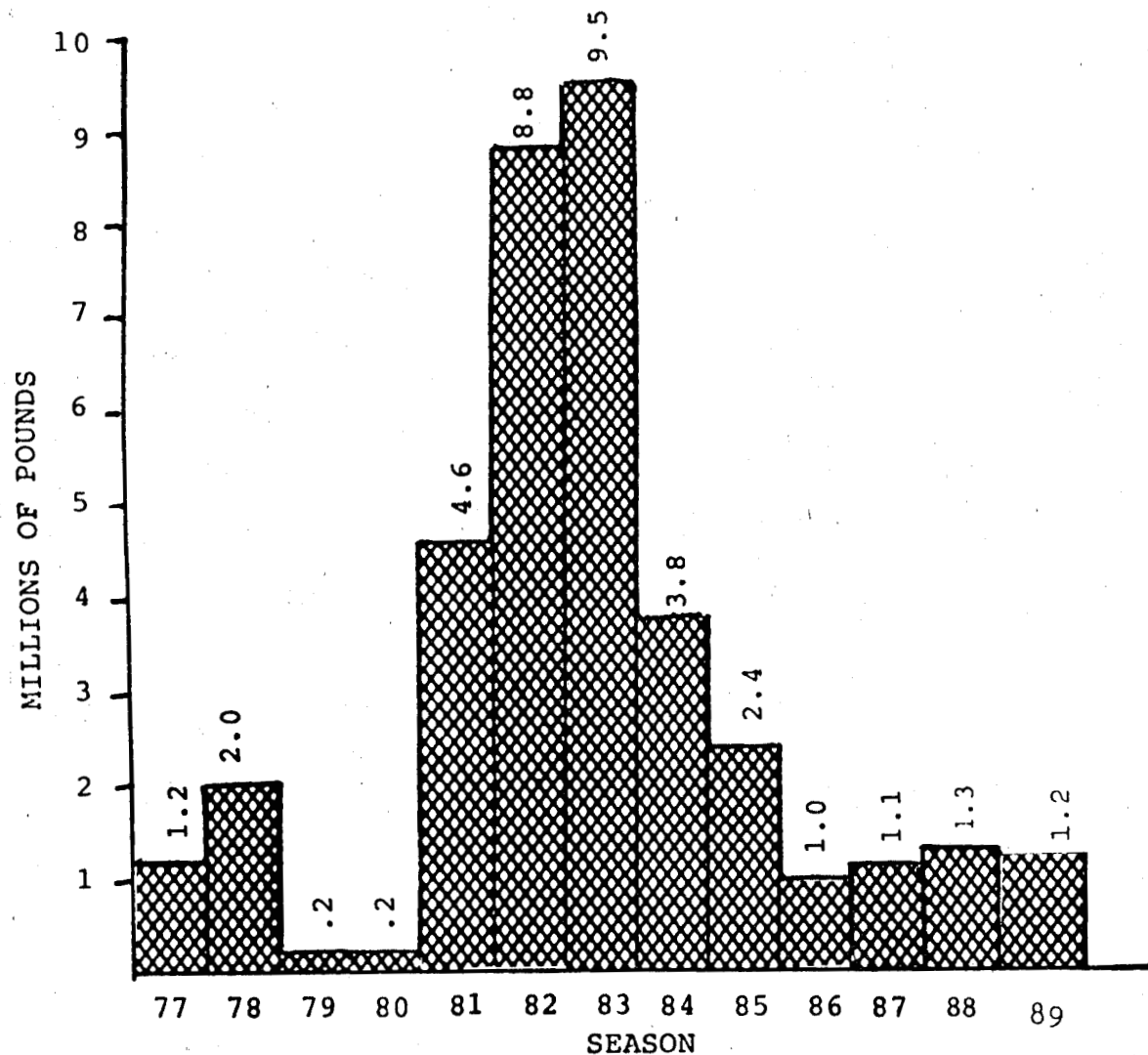


Figure 5. Historic blue king crab catch in the Northern District of registration Area "Q" (St. Matthew and St. Lawrence islands).

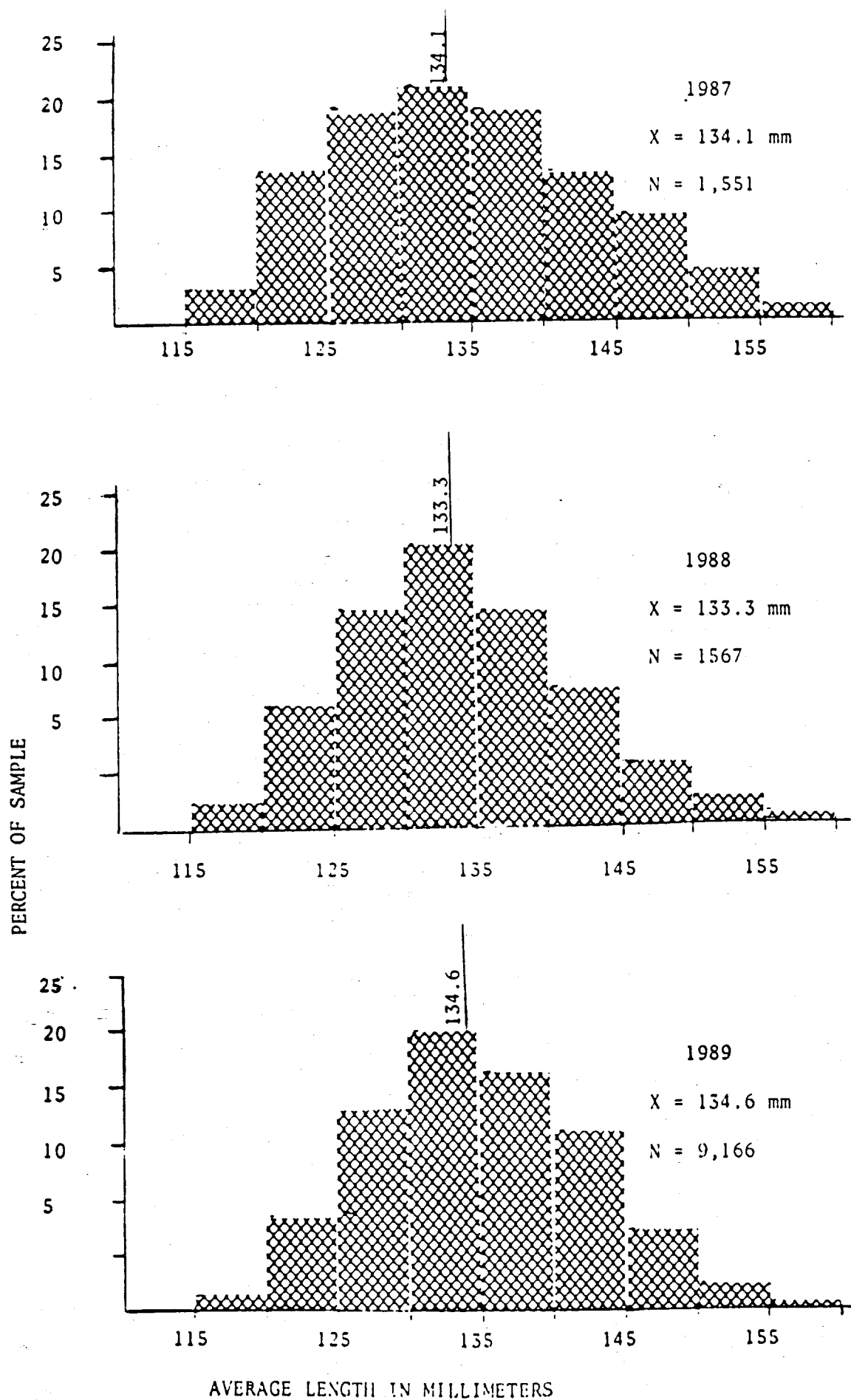


Figure 6. Blue king crab length frequency distribution from the St. Matthew section of the Bering Sea.

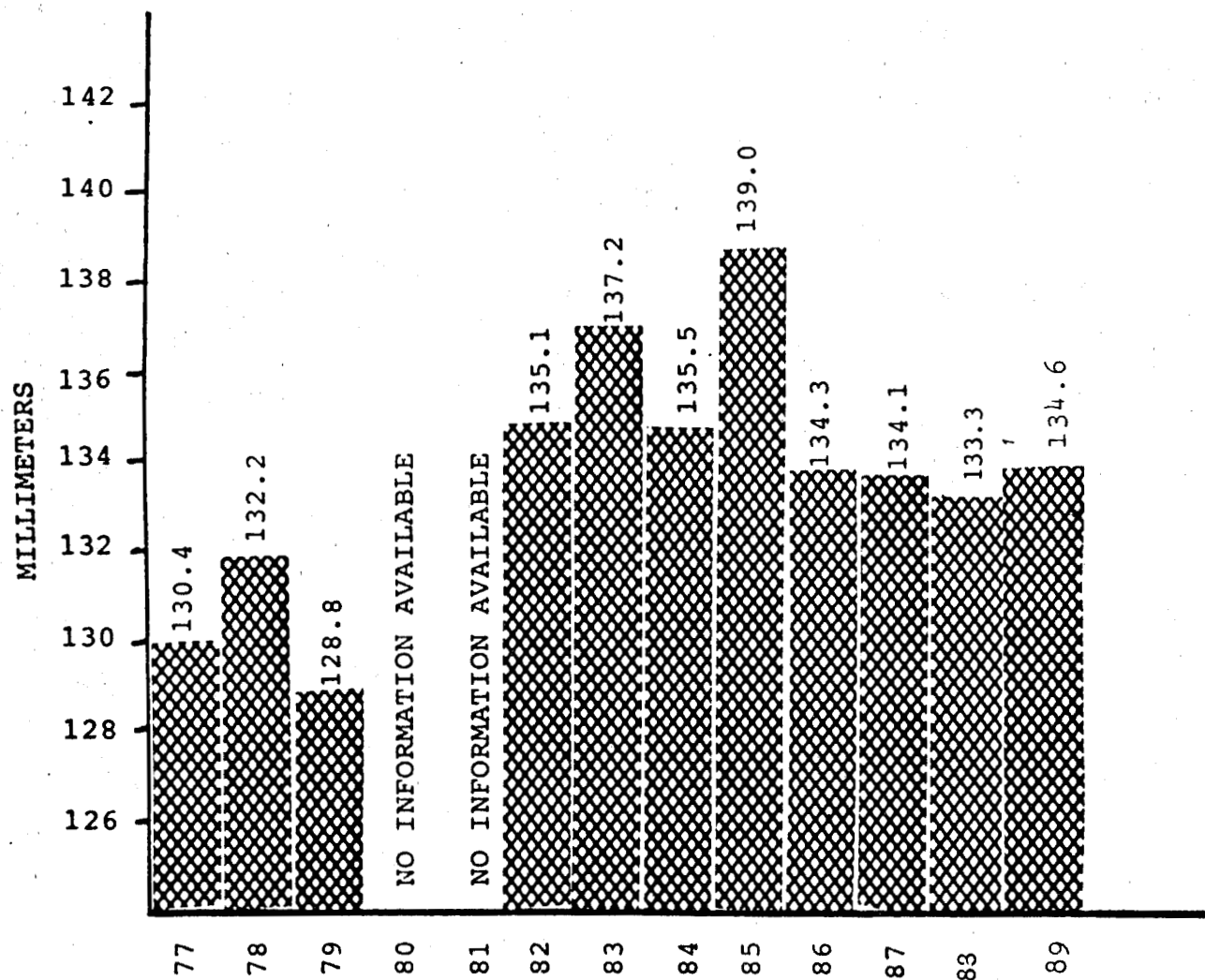


Figure 7. Historic St. Matthew blue king crab average length frequencies.

BERING SEA BROWN KING CRAB

1989 PERMIT FISHERY - PRIBILOF DISTRICT

The Pribilof District received effort incidental to the Northern District during 1989. This area has not produced large catches since the 1983/84 season when 856,475 pounds was caught (Table 1).

NORTHERN DISTRICT

Although the season remained open after the closure of the Western Subdistrict *C. opilio* fishery, only two vessels fished the Area for brown king crab.

STOCK STATUS

No population estimates are made of the Bering Sea brown king crab stocks. Catches appear to vary with the amount of fishing effort and the continuation of other fisheries in the areas.

Table 1. Historic brown king crab catch in the Pribilof District of the Bering Sea, Area 'Q'.

Year	Vessels	Landings	Crab ¹	Pounds ¹	Pots Lifted	CPUE	Avg. Wt.	Average Length	Pounds Deadloss
1981/82	2	3	1,961	8,301	794	2	4.2	-	0
1982/83 ²	10	19	15,330	69,970	5,252	3	4.6	150.5	570
1983/84 ³	50	115	253,162	856,475	26,035	10	3.4	127.3	20,041
1984 ⁴			N O R E P O R T E D L A N D I N G S						
1985	1	1	31	142	350	-	4.6	-	0
1986	1	1	800	3,530	600	1	4.4	N/A	0
1987	1	1	6,457	25,830	800	8	4.0	N/A	0
1988	2	2	758	2,660	230	3	3.5	N/A	0
1989	2	3	1,619	6,573	578	3	4.0	N/A	0

¹ Deadloss included

² Six and one-half inch season

³ Five and one-half inch season

⁴ Permit fishery July through December

NOTE: This page contains some confidential information not for public distribution.

Table 2. Historic brown king crab catch in the Northern District of the Bering Sea, Area 'Q'.

Year	Vessels	Landings	Crab ¹	Pounds ¹	Pots Lifted	CPUE	Avg. Wt.	Average Length	Pounds Deadloss
1982/83	22	30	51,714	193,507	7,825	6	3.7	138.2	957
1983/84			N O	R E P O R T E D	L A N D I N G S				
1985			N O	R E P O R T E D	L A N D I N G S				
1986			N O	R E P O R T E D	L A N D I N G S				
1987	11	29	101,618	424,394	14,525	7	4.2	142.2	11,750
1988	11	23	36,270	160,441	11,672	3	4.4	150.2	14,000
1989	2	4	1,059	4,407	799	1	4.2	N/A	0

¹ Deadloss included

NOTE: This page contains some confidential information not for public distribution.

MISCELLANEOUS SHELLFISH BYCATCH

During 1989, for the first time, shellfish bycatch has been documented on fish tickets by bottom trawl vessels. The catch of these species is small compared to the overall population of the species reported, and the usage varies from total discard to octopus used for food and bait. None of the vessels involved were registered for shellfish.

TABLE 1. 1989 REPORTED BOTTOM TRAWL FISH TICKET BYCATCH STATISTICS BY AREA

Species	Bering Sea	Eastern Aleutians	Western	Total
Octopus ¹	20,143	612	887	21,334
Landings	68	8	1	76
Tanner Crab ²	956	1983	NR	2,939
Landings	2	1	NR	3
King Crab ²	NR	NR	5	5
Landings	NR	NR	1	1
Scallops ²		20		

¹ 2,697 pounds delivered as bait.
17,093 pounds delivered as food.
1,544 pounds discarded at sea.

² All discarded at sea.

STATE OF ALASKA
MANDATORY SHELLFISH OBSERVER PROGRAM REPORT
TO
ALASKA BOARD OF FISHERIES

MARCH 1990

BY

ALAN J. QUIMBY - SHELLFISH OBSERVER PROGRAM COORDINATOR

Dutch Harbor Area Office
P. O. Box 308
Dutch Harbor, Alaska 99692
(907) 581-1239

STATE OF ALASKA MANDATORY SHELLFISH OBSERVER PROGRAM

INTRODUCTION

In April 1988, the Alaska Board of Fisheries adopted regulations requiring onboard observers for all vessels that process king crab and *C. bairdi* Tanner crab in Alaskan waters. Although the regulation 5 AAC 39.645 applies statewide, the program has had the most activity in the Bering Sea and Aleutian fisheries.

The Mandatory Observer Program was adopted after the Board received historic catch data on catcher/processors operating in the Bering Sea and Aleutian Island fisheries. Alaska Department of Fish and Game staff reports to the Board indicated large catch discrepancies between catcher only vessels and catcher/processors and concluded that the only way to explain the difference is that sublegal crab were being processed by the catcher/processors. The Board also agreed that the observer program would be the only means of obtaining much needed biological information from the shellfish fisheries.

The cost of the program is to be borne by industry with vessels hiring observers through a third party contractor. An observer will be onboard vessels during all processing operations unless waived by the Department.

The Department developed guidelines and certification requirements for the observers and provided training, data collection standards and forms. Observers were in place beginning with the Bristol Bay red king crab fishery on September 25, 1988. Reporting and data collecting criteria were established for each fishery.

THE CERTIFICATION PROCESS

To ensure observers were trained, conflict of interest requirements were met and observers were represented by contractors; four certification courses were conducted in 1988. The three-day classes; one in Seattle, two in Anchorage and one in Dutch Harbor certified 82 people of the 100 that attended. Three ADF&G staff members and the Fish and Wildlife Protection officer from Dutch Harbor conducted the courses.

Industry, through contractors, was to provide trained people to be certified. This was the case in Seattle as people attending the course were experienced ex-National Marine Fisheries Service observers. Both Anchorage sessions turned out to be training courses as well as certification courses. The courses began with an orientation explaining the roles of industry, contractors and the department. The actual certification consisted of two parts: 1) the final review of crab identification, crab measurement, sampling objectives and procedures, regulations, radio codes and procedures, and 2) a practicum consisting of a written test and identification of crab species.

A fifth certification course was given in August of 1989 at the University of Alaska, Anchorage. A two week training course was conducted by Professor John Doyle of the Alaska Sea Grant Program, University of Alaska Fairbanks, for contractor's prospective observers. Some contractors elected to conduct their own training courses. All trained prospective observers were given an exam at U.A.A. by the Observer Coordinator from Dutch Harbor. Approximately 50 people out of 60 that attended were certified.

APPLICATION

The Mandatory Observer Program was initiated for the 1988 Bristol Bay red king crab season which began September 25, 1988. The program has been active for over a year with observers

participating in nine fisheries (Table 1). There were 112 occasions to use observers with 56 different observers participating. Thirty five observers were Alaska residents, and 21 observers were nonresidents. The observers accumulated 106.75 man-months of activity in the first year of the program (Figure 1). A similar trend can be seen in the first months of the second year (Figure 2).

Observers attend a briefing session prior to each opening and are required to be onboard their respective vessels as part of the tank inspection and registration procedures. Observers are briefed at the local Fish and Game area office, given a crab identification test, and taken down on the docks by staff observers to work on crab being delivered, if available.

Daily reports were required from all observers during all king and Tanner crab fisheries. Observers reported, in code, the number of legal males, pots pulled, sampling conditions and statistical areas fished during the previous twenty-four hour period. One hundred percent reporting was experienced by contract observers.

After the closure, or when observers leave their vessels, they are debriefed individually in the respective ADF&G area office. Sampling forms are reviewed with each observer to insure all notes, explanations and observations are understood by the department. Questions pertaining to harassment, illegal crab, fishing ethics and general fishing operations are asked. Additional time is spent with people who have experienced problems.

RESULTS

Preliminary data indicates that the observers' presence onboard the catcher/processors has served as a deterrent for taking undersized crab (Table 2). This does not suggest that all catcher/processors or floating processors have taken undersized crab in the past.

The bycatch data provided are only from those fisheries with more than three vessels or processors providing data from the aggregated summary (Table 3). The data includes limited Department of Fish and Game observer data, the catcher processor mandatory observer data, and data from one NMFS observer, sponsored by the Alaska Crab Coalition. Bycatch data from Dutch Harbor brown king crab in 1988 and Bristol Bay red king crab in 1988 and 1989 had too few vessels observed to release data. The emphasis on data collection for this fishery was enforcement of the size limit. The rapid pace of the fishery also precluded, in many cases, the observer collection bycatch data from the pots.

PROBLEMS ENCOUNTERED WITH ONBOARD OBSERVER PROGRAM

Problems encountered with industry:

1. Vessel owners/operators selecting their own observers from lists provided by contractors.
2. Owner/operators have changed contractors to get "less experienced, less strict" observers.
3. Industry has offered gratuities to observers to "turn their heads."
4. Observers were put ashore before product was processed or off loaded.
5. Not reporting catch figures on schedule as required.
6. Denied access or information to observer.
7. Took advantage of inexperienced observers by working them on deck, wheel watches, maintenance, etc.

Problems encountered with the contractors:

1. Allowing vessel owners and operators to scan observer lists and choose their own observers.
2. Having family members involved in the same fishery.
3. Having a financial interest in the same fishery.
4. Hiring family members as observers.
5. Not properly training observers

Problems encountered with the observers:

1. Substance abuse!
2. Accepting gratuities.
3. Incorrectly measuring and aging crab.
4. Failure to complete data forms.
5. Falsifying data forms.
6. Not complying with reporting schedule.
7. Inaccurate reporting of coded data.
8. Observers making arrangements directly with industry for contracts.
9. Observers not notifying the department of improper activities.
10. Observers being over zealous in regulation enforcement, when in actuality they have no enforcement authority.
11. Not completing duties due to seasickness.

Problems involving Fish and Game:

1. Training and testing program is too lenient.
2. Failure to detect erroneous or missing data in a timely manner.
3. Allowing observers to be briefed and debriefed in area Fish and Game offices not responsible for the management of that particular fishery.
4. No recertification procedure or time limit for observers who have not worked as an observer.
5. Inadequate standards for certification and decertification of contractors.
6. No adequate means to rescue observers from vessels.
7. Allowing catch reports in long-term fisheries to go unreported for several weeks.
8. Doing contractors' jobs as a go-between for vessel and observer.
9. Providing contractors' employee lists to other competing contractors.
10. No method of routinely evaluating observers by vessel operator or owner.
11. Not providing adequate briefing and debriefing facilities.

12. Failure to set up formal review board for decertification of observers and contractors.
13. Failure to follow up with reliable debriefings of observers on catcher/processor vessels that may be transporting product out of the state.

CONCLUSION

The Mandatory Crab Observer Program as drafted had two major goals: enforcement and data collection.

The program has had varied success at obtaining its objectives. During the first few months of the program there was a tremendous dampening of illegal crab retention. Since then this ability has continued to erode. The collection of biological data has been greatly lacking or nonexistent.

The failures of the program stem entirely from the Department's inability to directly control hiring, training and placement of observers. The Department has only the power to react by decertifying an observer after the problem has occurred. The Observer Coordinator and other staff are spending more time trying to handle conduct problems with observers and contractors than collecting biological data.

The third party contracting for observers is not a desirable program, and should be replaced by a fully funded State or Federal program.

Table 1. Distribution of observers by area and vessels type.

Bristol Bay	1988	1989
Species	Red	Red
Number Catcher Processors/ Observers	20/20	18/18
Number Floater Processors/ Observers	5/3 ¹	12/12
Observer Days	322	483
Adak	1988/89	1989/90
Species	Red/Brown	Red/Brown
Number Catcher Processors/ Observers	16/32	14/14
Number Floater Processors/ Observers	6/9 ²	5/5
Observer Days	2,985	On Going
Dutch Harbor	1988	1989/90
Species	Brown	Brown
Number Catcher Processors/ Observers	1/1 ³	6/9
Number Floater Processors/ Observers	0/0	2/3
Observer Days	14	231
St. Matthew	1988	1989
Species	Blue	Blue
Number Catcher Processors/ Observers	0/0	15/15
Number Floater Processors/ Observers	0/0	6/6
Observer Days	0	294

continued....

Table 1. Distribution of observers by area and vessel type
(continued).

Bering Sea	1988 ⁴	1989	1990
Species		C. bairdi	C. bairdi
Number Catcher Processors/ Observers		5/6	5/5
Number Floater Processors/ Observers		0/0	8/8
Observer Days		252	On Going
Bering Sea	1988 ⁴	1989	
Species		Brown	
Number Catcher Processors/ Observers		2/2	
Number Floater Processors/ Observers		0/0	
Observer Days		35	
South Peninsula	1988 ⁴	1989	
Species		C. bairdi	
Number Catcher Processors/ Observers		0/0	
Number Floater Processors/ Observers		2/2	
Observer Days		28	
Norton Sound	1988 ⁴	1989	
Species		Red	
Number Catcher Processors/ Observers		7/7	
Number Floater Processors/ Observers		0/0	
Observer Days		49	
Continued....			

Table 1. Distribution of observers by area and vessel type
(continued).

Chukchi Sea\St. Lawrence	1988 ⁴	1989
Species	Red/Blue	
Number Catcher Processor/ Observers	5/5	
Number Floater Processors/ Observers	0/0	
Observer Days	70	

¹Two floater processors waived.

²One observer replaced due to harassment problem.

³Observer program initiated after season opened.

⁴Observer program not in affect.

Table 2¹. 1987, 1988 and 1989 mean values for catcher/processor vessel and catcher vessel with length between 130 ft and 170 ft.

	Catcher Vessels			Catcher/Processor Vessels			Ratios		
	1987	1988	1989	1987	1988	1989	1987	1988	1989
Pounds landed	54844	40131	59392	136074	53817	71917	2.48	1.34	1.21
Number of pot-lifts	1013	795	1305	1396	1043	1209	1.37	1.31	.93
Pounds per pot-lift	58.5	54.4	47.0	92.4	50.9	56.1	1.58	0.94	1.19
Number of pots registered	300	316	332	398	410	391	1.32	1.30	1.18
Pounds per pots registered	183.0	126.9	176.0	330.3	132.4	180.9	1.80	1.04	1.03
Vessel length (ft)	152	155	152	155	158	159	1.01	1.05	1.05

¹Data Source: *Regional Information Report No. 4K89-1 Alaska Department of Fish and Game Division of Commercial Fisheries, Westward Region.* By: Dana Schmidt and B. Alan Johnson.

Table 3. Incidental catch rate, number of animals per metric ton of landed crab and number of animals per landed crab, in observed crab fisheries, Sept. 1988 thru August 1989. Three fisheries, Dutch Harbor brown crab in 1988 and Bristol Bay red crab in 1988 and 1989, had too few vessels observed to release data.

	Bering Sea Eastern District <i>C. bairdi</i> 1989						Adak Brown King Nov 1, 1988 thru Aug 15, 1989					
	-----No./mt-----		-----No./Crab-----				-----No./mt-----		-----No./Crab-----			
	Mean ¹	Min ²	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
TANNER ³												
Legal				-----Target Species-----			2.7	0 ⁴	251	0.005	0.000	0.490
Sublegal	1391.8	279	1979	1.515	0.303	2.155	17.9	0	879	0.035	0.000	1.714
Female	178.6	14	265	0.194	0.015	0.289	10.6	0	565	0.021	0.000	1.103
TOTAL	1570.4	292	2245	1.710	0.318	2.444	31.2	0	1695	0.061	0.000	3.307
KING ⁵												
Legal	245.6	0	780	0.267	0.000	0.849	-----Target Species-----					
Sublegal	502.2	0	1381	0.547	0.000	1.504	534.8	171	2066	1.043	0.333	4.029
Female	250.9	0	834	0.273	0.000	0.907	609.4	231	2323	1.189	0.451	4.531
TOTAL	998.8	0	2995	1.087	0.000	3.261	1144.2	402	4389	2.232	0.784	8.560
COD	112.4	14	187	0.122	0.015	0.204	44.4	6	820	0.087	0.012	4.531
HALIBUT	1.0	0	19	0.001	0.000	0.021	4.1	0	18	0.008	0.000	0.034
No. Pots				1322					1385			
No. Vessels				7					13			
Mortality Rate Estimate												
Fishery lbs.				6,948,201					8,957,945			
Deadloss lbs. ⁶				34,664					122,251			
Deadloss/Mort. Rate				0.5%					1.4%			

¹The Mean is the fishery average.

²The Min and Max are the extreme individual vessel rates.

³Incidental catch of Tanner crab in the brown king crab fishery was predominantly *C. bairdi*.

⁴0 and 0.000 indicate no catch.

⁵Incidental catch of king crab in the *C. bairdi* crab fishery was predominantly red king crab.

⁶The fishery deadloss is used as an estimate of incidental catch mortality.

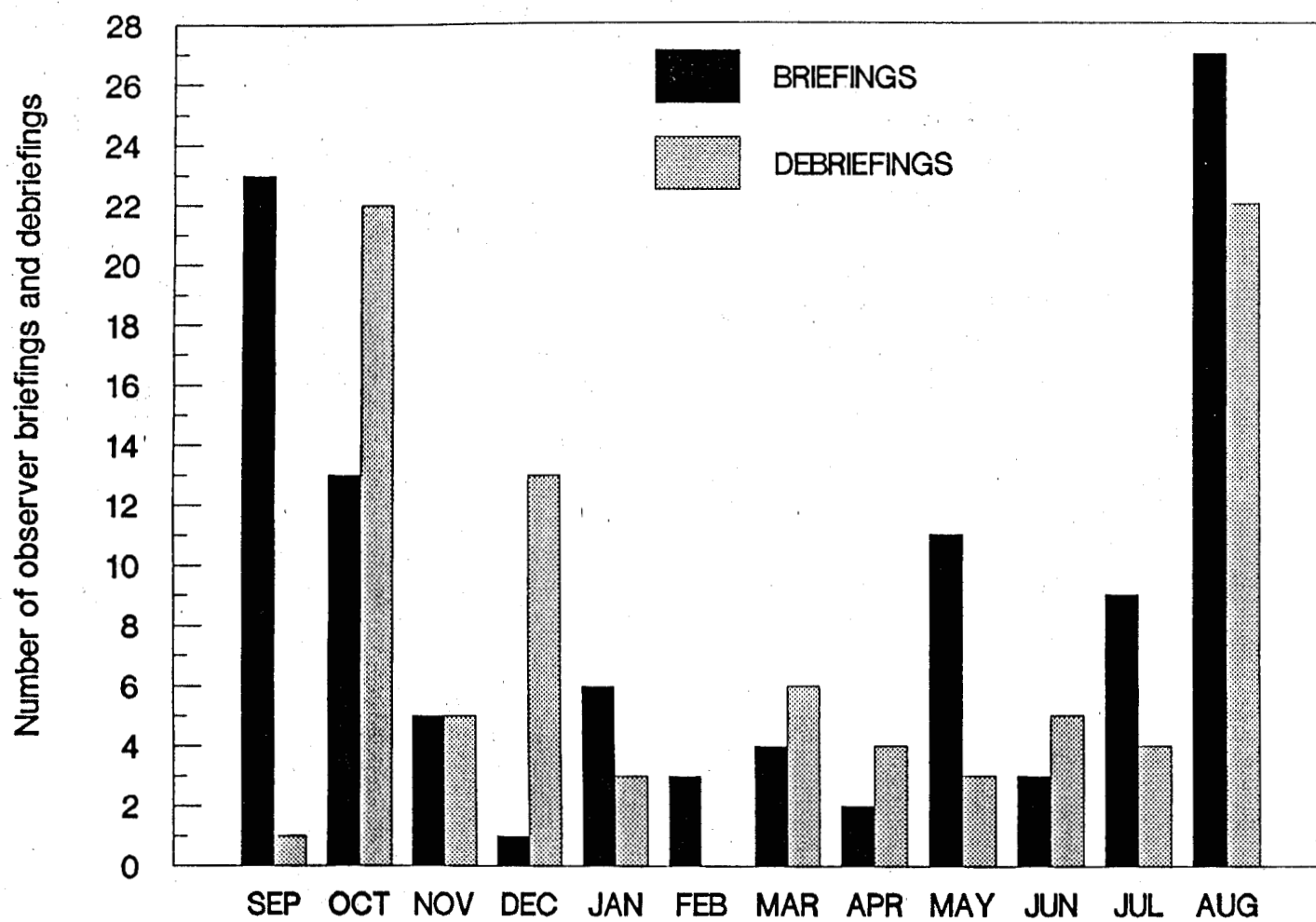


Figure 1. Number of observer briefings and debriefings per month in the 1988/89 Westward Region crab seasons.

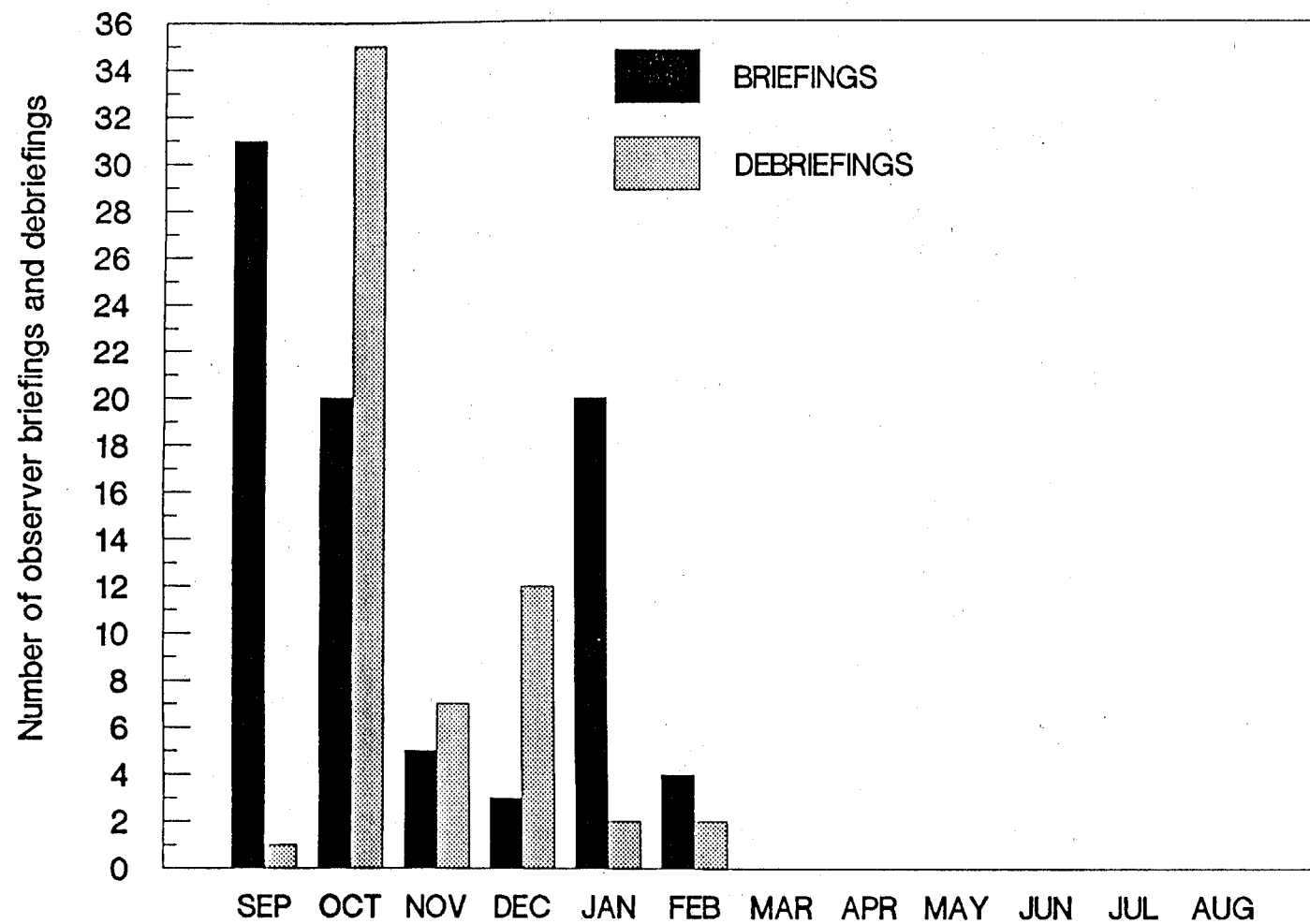


Figure 2. Number of observer briefings and debriefings per month in the 1989/90 Westward Region crab seasons.

A COMPARISON OF CATCHER-PROCESSOR VESSEL AND CATCHER VESSEL FISHING
PERFORMANCE IN THE 1989 BERING SEA RED KING CRAB FISHERY

By: Dana Schmidt
B. Alan Johnson

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Kodiak, Alaska 99615

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¹Contribution 4K90-2 from the Kodiak area office. The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished divisional reports. These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate timely reporting of recently collected information, reports in this series undergo only limited internal review and may contain preliminary data; this information may be subsequently finalized and published in the formal literature. Consequently, these reports should not be cited without prior approval of the author or the Division of Commercial Fisheries.

Abstract

This report is the third in a series, evaluating differences in catch rates between catcher processors and catcher vessels in the Bering Sea red king crab fishery. During the 1988 and 1989 Bristol Bay red king crab fishery, on-board observers were placed on catcher-processor vessels. In the 1989 fishery, the average pounds landed per catcher vessel was approximately 59,000 compared with an average of approximately 72,000 for the catcher-processor vessels when comparisons of vessels of similar sizes were made (130 ft-170 ft). The landing rate was 47 pounds per pot-lift versus 56 pounds per pot-lift respectively. In 1989 as in 1988, the pounds landed per pot-lift, and pounds landed per number of registered pots by catcher-processor vessels were not significantly larger than the catcher vessels but differences in these rates were highly significant in 1987. We conclude that the observer program which was instituted in the 1988 and 1989 fishery remains the primary factor contributing to the similarity in the catch per unit effort reported by the catcher fleet and the catcher-processor fleet. There does appear to be a shift in CPUE between the past two years, although not statistically significant. Continued vigilance is warranted to insure that observers remain effective in deterring undersized processing.

Introduction

This report is a continuation of previous examinations of the differences in catch rates observed between catcher-processor vessels and catcher vessels participating in the Bristol Bay red king crab fishery. The previous reports, hereafter referred to as the 1987 Report or the 1988 Report², addressed differences between the 1987 and 1988 fisheries. This observer program was first implemented during the 1988 Bristol Bay red king crab fishery. The differences in catch rates reported in the 1987 Report was one of the factors considered by the Board of Fisheries in establishing the mandatory observer program. This report addresses the catch rates observed between the catcher-processor fleet and the catcher fleet during the 1989 fishery and compares these results with the 1988 Report.

The number of catcher-processor vessels that participated in recent Bristol Bay red king crab fishery was similar to the previous year with 18 participating catcher-processor vessels in 1989 as compared with 20 in 1988.

This report examines apparent differences in catch rates between the catcher-processor vessels and catcher vessels in the 1989 fishery. Because of the high number of observers that were decertified, the effectiveness of the program as a deterrent to processing sub-legal animals has been questioned. The vessel size, the number of pots registered, and the number of pots lifted are examined in this report, similar to the 1988 Report. Because of the area manager's observation of potentially more pots being fished by catcher-processor vessels, and consequently, increased soak times, we have examined the number of pot-lifts closer by comparing them with the number of pots registered. The use of numbers of pots registered provides an alternative method of examining the effective amount of effort of a given vessel and coupled with pot-lift data, soak time effects on catch per unit effort (CPUE) can be evaluated. Catch per unit effort was projected by using the reported number of pot-lifts and the number of pots registered as the effort.

Therefore, the objective of this analysis is to determine if the pounds landed and the CPUE were significantly different for the catcher-processor vessels in the fishery held during September 1989 and to determine if on-board observers remained effective. If CPUE differences occurred, we examined if these differences can be explained by known differences between the two types of vessels or changes in soak time.

Methods

The methods used are the same as those reported in the 1988 Report. The data used in this analysis were obtained from the fish tickets and vessel registration forms. For catcher-processor vessels, a single fish ticket was usually submitted for the entire season, although on

²Schmidt, D. and B. A. Johnson. 1988. A Comparison of Catcher-Processor and Catcher Vessel Fishing Performance in the 1987 Bering Sea Red King Crab Fishery. Regional Information Report No. 4K88-14. Alaska Department of Fish and Game, Division of Commercial Fisheries, Kodiak.

Schmidt, D. and B. A. Johnson. 1989. A Comparison of Catcher-Processor and Catcher Vessel Fishing Performance in the 1988 Bering Sea Red King Crab Fishery. Regional Information Report No. 4K89-1. Alaska Department of Fish and Game, Division of Commercial Fisheries, Kodiak.

longer fisheries, a fish ticket is completed weekly. For catcher vessels, a ticket is completed at each landing. The basic data from the fish tickets consisted of pounds landed, number of crab landed, and number of pot-lifts. The basic data from the vessel registration forms consisted of numbers of pots registered and length of vessel. The data resolution is that of vessel, i.e. multiple fish tickets were combined for a single vessel.

For testing differences in means we used the non-parametric test that was used in the 1987 and 1988 Reports. The test used is known as the Mann-Whitney or Wilcoxon rank sum test (Conover 1980).

A graphical method was used to locate differences in the sampling distributions of these data. The quantile-quantile plot or Q-Q plot (Chambers et al. 1983, Hoaglin et al. 1983, and Gnanadesikan 1977) can be used to determine if a sample distribution is similar to some other distribution. The analysis of distributional differences was necessary because we could easily have had a segment of the catcher-processor fleet that landed crab at normal or sub-normal rates, while another segment of the catcher-processor fleet that experienced very high landing rates. Differences in means may be very minor in this case, but distributional differences could be very large. Because the distributional patterns did not show any patterns not observed in the 1988 and 1987 Reports, the plots were not included in this report.

Results

Comparisons of Pounds Landed and CPUE for 1989

All mean values for each variable except the pounds per pot-lift and pounds per pot registered were significantly greater for the catcher-processor vessels as indicated by the test statistics (Table 1). This is identical with the 1988 fishery data.

Table 1.— Test statistics for difference in mean values between catcher-processor vessel (N=18) and catcher vessel (N=193).

Variable	Mean values		Ratio of means	P-value Wilcoxon test
	Catcher vessel	Catcher-processor vessel		
Pounds landed	46276	74085	1.60	<0.01
Number of pot-lifts	957	1296	1.35	<0.01
Pounds per pot-lift	50.0	55.0	1.10	0.10
Number of pots registered	248	388	1.56	<0.01
Pounds per pots registered	187.1	189.4	1.01	0.45
Vessel length (ft)	100	161	1.60	<0.01

Examination of the Q-Q plot CPUE data for the entire data set or for the subset of data reflecting vessels in the 130 ft-170 ft category, did not suggest any trends not observable from the tabular data. Therefore the plots are not presented in this report.

Although the difference in average pounds landed between the two vessel types is significant ($P < 0.01$), the pounds landed may be affected by the number of pot-lifts or the size of vessel. As an alternative measure of effort, registered number of pots was also used as a comparative basis. For both measures of CPUE, the catcher-processor vessels did not have significantly different values when compared to the catcher vessels (Table 1). Note that the P-value for pounds per pot-lift is 0.10 as compared with 0.38 the previous year for the same parameter. This value is not considered significant using the $P = 0.05$ criteria.

As in previous years, we further examined the data to determine if length of vessel would explain the differences observed. To provide similar size classes of both catcher-processor and catcher vessels, vessels of 130–170 feet were selected, identical to the procedures used in 1987 and 1988. This group included 10 catcher-processor vessels and 19 catcher vessels. This grouping provided sufficient numbers of vessels and low significant difference of length ($P = 0.03$) (Table 2).

Table 2.— Test statistics for difference in mean values between catcher-processor vessel (N=10) and catcher vessel (N=19) with length between 130 ft and 170 ft.

Variable	Mean values		Ratio of means	P-value Wilcoxon test
	Catcher vessel	Catcher-processor vessel		
Pounds landed	59392	71917	1.21	0.34
Number of pot-lifts	1305	1209	0.93	0.19
Pounds per pot-lift	47.0	56.1	1.19	0.18
Number of pots registered	332	391	1.18	0.04
Pounds per pots registered	176.0	180.9	1.03	0.48
Vessel length (ft)	152	159	1.05	0.03

For vessels of size 130–170 feet in length, there was not a statistical difference between mean pounds landed, contrary to the observations of 1988. Neither measure of CPUE shows a statistical difference between catcher-processor vessels and catcher vessels as would be expected from the previous examination of the full fleet (Table 2). The number of pot-lifts are not significantly different for the catcher-processor vessels, also differing from the 1988 fishery.

Comparisons of 1987, 1988 and 1989 Fisheries

We have analyzed the 1989 Bering Sea red king crab fish ticket data in an attempt to determine if a disparity existed in pounds landed per unit effort between the catcher vessels and

the catcher-processor vessels. If a disparity exists, two possible explanations are possible. Illegal catch could be one explanation, because of the high number of observers which were decertified during 1989. This suggests that their ability to act as deterrents to sub-legal processing may have been compromised. Increased soak times is one other possible explanation suggested by ADF&G management staff. This should be detectable as a discrepancy between the pounds landed per pot-lift, and the pounds landed per pot registered.

Table 3 tabulates the differences in the catch values between 1987, 1988 and 1989 for both vessel types between 130 and 170 ft in keel length. The pounds landed by the catcher-processor vessels in 1989 were approximately 1.2 times higher than the catcher vessels, when considering vessels of similar length. This compares with 2.5 times higher in 1987 and 1.3 times in 1988. It is a safe assumption that the pounds landed are relatively free from reporting errors. When comparing the vessels in total, the catcher-processor vessels had landings that were 1.6 times larger that of the catcher vessels in 1989 versus 2.3 times larger in 1987, and 1.4 times in 1988.

Table 3.— 1987, 1988 and 1989 mean values for catcher-processor vessel and catcher vessel with length between 130 ft and 170 ft.

Variable	Catcher vessels			Catcher-processor vessels			Ratios		
	1987	1988	1989	1987	1988	1989	1987	1988	1989
Pounds landed	54844	40131	59392	136074	53817	71917	2.48	1.34	1.21
Number of pot-lifts	1013	795	1305	1396	1043	1209	1.37	1.31	.93
Pounds per pot-lift	58.5	54.4	47.0	92.4	50.9	56.1	1.58	0.94	1.19
Number of pots registered	300	316	332	398	410	391	1.32	1.30	1.18
Pounds per pots registered	183.0	126.9	176.0	330.3	132.4	180.9	1.80	1.04	1.03
Vessel length (ft)	152	155	152	155	158	159	1.01	1.05	1.05

Note in Table 2 that there was not a significant difference in pots lifted between vessels for 1989 but a significant difference in the numbers of pots registered. Assuming all registered pots were fished, longer soak times would have occurred. Although CPUE values were not significant between vessel types, the change in CPUE expressed as pounds per pot from the 1988 data, may be explained by longer soak times reflecting nearly identical pounds per pot registered during 1988 and 1989. Note also that the differences from 1987 are still quite large, reflecting the continued effectiveness of on-board observers in providing similar CPUE values between vessels of similar size, regardless of processing modes.

Discussion

Analysis of vessels of all lengths indicates that catcher-processor vessels had average pounds landed per pot-lift higher than that of an average catcher vessel but not significant. When the vessels compared were vessels of similar keel lengths, average pounds landed per pot-lift

by catcher-processor vessels was again not significantly different than that reported by the catcher vessels.

When compared with 1988, the mean 1989 CPUE expressed as pounds per pot-lift increased. However the catch per pot registered stayed essentially the same. Since the number of pot-lifts reported by catcher-processor vessels dropped in 1989, the differences in CPUE observed can be explained by increased soak time. When compared with 1987, the effectiveness of the on-board observers remains obvious.

From the previous discussion, it appears that parity in the fleet has been maintained in 1989 by the presence of mandatory observers on the catcher-processor vessels. Changes in CPUE values expressed as pounds per pot-lift were not paralleled when CPUE was expressed as pounds per pot registered. Since pot-lifts dropped in the catcher-processor fleet, when compared with the equivalent sized catcher fleet, increased soak time may be a primary cause of the difference. The economic advantage of catcher-processor vessels, beyond the processing capabilities, previously explained by the increased number of pot-lifts in 1988, is now explainable by increased soak time of the number of pots registered. However, the difference in average pounds landed between the vessel types was not statistically significant in 1989. Equivalent sized vessels, based on total number of pounds landed in 1989, actually caught crab at a lesser rate in 1989 (1.21 differential) than in 1988 (1.34). If comparative increased CPUE from catcher-processor vessels were in part, caused by lack of observer diligence, the amount is too small to be detected by the analysis presented here.

Conclusions

We examined the pounds landed as a function of the number of vessels, the number of pot-lifts, and the number of pots registered to determine if significant differences occurred. With an on-board observer the pounds landed for catcher-processor vessels was larger than catcher vessels but not significantly larger in 1989. Both 1989 and 1988 rate of landings contrast sharply with 1987 data. Our conclusions have not changed since the 1988 report. To provide equal enforcement of size and sex regulations established for this fishery it is essential that a mandatory on-board observer program continue. The costs of continuing this program are very small when compared with the potential value of illegal crab taken by unobserved processing vessels.

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WESTWARD REGION
SHELLFISH RESEARCH REPORT
TO
ALASKA BOARD OF FISHERIES

MARCH, 1990

BY

DANA SCHMIDT, REGIONAL RESEARCH BIOLOGIST
FORREST BLAU, ASSISTANT SHELLFISH RESEARCH BIOLOGIST
BILL DONALDSON, REGIONAL SHELLFISH RESEARCH BIOLOGIST
DOUG PENGILLY, BIOMETRICIAN, SHELLFISH POPULATION DYNAMICS
B. ALAN JOHNSON, REGIONAL BIOMETRICIAN

Kodiak Area Office
211 Mission Road
Kodiak, Alaska 99615
(907) 486-4791

SUMMARY

The research efforts of the Westward Region address the crab stock assessment programs for the Kodiak and Sandpoint Areas, in the development of harvest guidelines for these areas. The results of these surveys are summarized under the Management Sections and in previous reports to industry and will not be repeated here. In addition the research staff have developed alternative management harvest strategies and management plans for the Kodiak red king crab, Bristol Bay red king crab, Pribilof Islands blue king crab and St. Matthew blue king crab stocks and are provided separately. In addition, an analysis of the catcher processor performance with observers during the 1989 fishery has been completed. This report is also included.

The red king crab stocks in the Westward Region remain at precariously low levels. The Bering Sea stocks have provided for a limited fishery but appear to continue a downward or at best a stable trend after the past years fishery. Landings at Adak remain very low with declining catch per unit effort causing a relatively rapid closure of this fishery. Kodiak, Dutch Harbor, and Sandpoint remain closed with very minimal recruitment occurring in all areas.

The research program is continuing to look at two separate studies addressing the decline of shellfish in the region. First we are beginning the second year of a study to determine if we can index larval settling of king and Tanner crab in the Kodiak area. This study is designed to provide an estimate of future recruitment, assuming larval settling is a major component in determining future populations of commercial sized animals. Several years will be required before definitive results can be expected. The second year study will involve deployment of collecting gear found suitable for indexing juvenile crab settlement during the 1989 study, in sufficient volume to provide a reasonable index of larval recruitment in the Chiniak Bay area. These studies will also contribute to the enhancement studies on red king crab offered by

the Kodiak Borough and currently being conducted by NMFS. By obtaining some insight as to what factor regulates the populations of red king crab, suggestions on potential enhancement activities may be forthcoming.

In addition, a proposed tagging study using a new technology is being investigated. A passive integrated transponder tag is being studied for its feasibility in determining population dynamic parameters of selected crab populations. We have proposed using the test fish funds to complete a pilot project by tagging Bristol Bay red king crab with this tag and recovering them in the commercial fishery. If this venture is successful, we may apply them to other stocks, such as Kodiak Tanner crab, Adak brown king crab, etc. Tag recovery could ultimately be automated such that a detector on processing lines could determine the presence of a tag and its unique identity as well.

Finally, the federal Saltinstal-Kennedy funds have been used to support a limited study of the effects of trawling on unobserved crab mortality. By use of tethered crab and scuba diving, this study provides insight into the effect of trawling on unobserved hard shell male king crab that encounter a typical commercial trawl, rigged for flatfish harvesting. The conditions set for this experiment attempted to find out what portion of the crab observed after a trawl codend is dumped onboard a vessel, reflects total mortality of all crab encountered by the trawl under a set of experimental conditions. The final report is in preparation and will be available for industry review.

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